set by local land management agencies based on established literature values and incorporate an adequate level of fry survival to provide for stable salmonid production.

Table 24. Sediment load allocations/reductions by erosion inventory reach.

Reach Number (from downstream to upstream)	Existing Erosion Rate (t/mi/y)	Total Erosion Rate (t/y)	Proposed Erosion Rate (t/mi/y)	Load Allocations (t/y)	Erosion Rate Percent Reduction	Percent of Total Erosion
Landslide	N/A	195	N/A	146	25	19
Upper	71	318	36	159	49	31
3 (Upper Middle)	10	46	6	28.5	40	5
2 (Middle)	5	6	6	8	0	<1
1 (Lower)	96	422	71	313	26	42
5 Road	9	24	5	14	44	2
Totals	**----------**	**1011**		**668**	**34**	**100**

Seasonal Variation and Critical Time Periods of Sediment Loading

To qualify the seasonal and annual variability and critical timing of sediment loading, climate and hydrology must be considered. This sediment analysis characterizes sediment loads using average annual rates determined from empirical characteristics that developed over time within the influence of peak and base flow conditions. While deriving these estimates it is difficult to account for seasonal and annual variation within a particular time frame; however, the seasonal and annual variation is accounted for over the longer time frame under which observed conditions have developed.

Annual erosion and sediment delivery are functions of a climate where wet water years typically produce the highest sediment loads. Additionally, the annual average sediment load is not distributed equally throughout the year. Erosion typically occurs during a few critical months. For example, in the Challis Creek watershed, most stream bank and road erosion occurs during spring runoff.

This sediment analysis uses empirically derived hydrologic concepts to help account for variation and critical time periods. First, field-based methods consider critical hydrologic mechanisms. For example stream bank erosion inventories account for the fact that most bank recession occurs during peak flow events when banks are saturated. Second, the estimated annual average sediment delivery from a given watershed is a function of bankfull discharge or the average annual peak flow event. Finally, it is assumed that the accumulation of sediment within dry channels is continuous until flow resumes and the accumulated sediment is transported and deposited.

Public Participation

The Challis Experimental Stewardship Group is the approved Watershed Advisory Group for the Upper Salmon and Pahsimeroi watersheds. The Challis Experimental Stewardship

Group is a cooperative group consisting of citizens and agency representatives involved in issues relating to improving land management practices to enhance range conditions and associated water quality wihile protectoing the cultural heritage and economics of the local community.

Upon completion of the Subbasin Assessment for the Upper Salmon River it was distributed to persons who expressed interest in receiving and reviewing it at the January 2001 Upper Salmon Basin WAG meeting. The Subbasin Assessment was also reviewed at the Custer County Soil and Water Conservation District Board meeting in December, 2000. On April 27th, 2001 a meeting was held in Challis, Idaho to further discuss the Subbasin Assessment and TMDL for the Pahsimeroi River and Upper Salmon River. The Upper Salmon River TMDL was reviewed with the Challis Experimental Stewardship Group on January 17th, 2002. A 30 day public comment period began January 31st and will continue through March 1st, 2002.

Public Comments and Responses

The public comment period for the Upper Salmon River Subbasin Assessment and TMDL was held during February 2002. Comments received from agencies and the public during the comment period are included with responses. Response to comments are in bold print following the individual comment when possible, or, if the comment was in letter or memo format, following the narrative.

Comments from Anthony Gammache (response in bold print)

February 26, 2002

Dear Sir,
I am writing this letter to comment on your January 2002 report on the Upper Salmon River Subbasin Assessment and TMDL.

I would like to make a few observations on the lower section of Challis Creek. I have lived there for more than 30 years. I would like to suggest some other causes for the sediment on the lower 1/3 of Challis Creek.

1) I have noticed that to the north of the creek a steep large body of granular unstable volcanic ash that is highly erodable. Even a small shower will move large quantities of soil. This is true in Darling Creek on down to the Salmon River.
2) In past years there have been many log jams and increased beaver activity, which has contributed greatly to the stream bank erosion. Most of us try to prevent the jams, but in high water this is sometimes impossible.
3) Because the grade on the lower 1/3 is much less than the upper part, it is expected that more sediment would settle out in that section.
4) As a comparison to Challis Creek, I suggest you consider Warm Spring Creek on the other side to Twin Peaks. It is basically the same Challis Volcanics as this side. There has been no human activity on the west side of Twin Peaks to speak of. However, there are large sections of very drastic erosion.

In conclusion I would like to make two suggestions. 1) You could analyze the fine sediments on the lower Challis Creek to see if much of it is coming from the hills to the north. 2) You could find an old stream channel that is not active. If you would dig down in it and carbon date it to prehuman activity you would get a base line to see the true potential of sediment load.

Yours truly,
Anthony Gammache

Response:

The types of land features you discuss in your comment can present opportunities to reduce sediment. It also increases the importance of managing riparian areas to reduce sediment inputs because of naturally elevated levels. Particularly if the feature you describe is natural, because historically, fish have been adapted to survive in this system, and excessive anthropogenic sediment sources can certainly tip the scale to make conditions less tolerable for the native and listed species in Challis Creek. Additionally, it may be that lower gradient reaches are primarily rearing habitat and not spawning habitat. In that case it is important to note that the TMDL targets for fine sediment at depth apply to spawning habitat. Spawning habitat is primarily found in pool tail-outs, and if the channel morphology is within normal limits then depth fines are typically below 30 percent even in watersheds with primarily volcanic geology.

While conducting fieldwork to complete the Challis Creek TMDL it was noted that above the area of beaver dams there were a number of log jams as well. Many of the logs in these upper jams were noted to have sawed edges, not beaver cut. It was apparent that at some time in the past, a number of trees were cut in such a way that they ended up in the stream resulting in an increase in the size and number of log jams. In some cases log jams are put in as a mechanism to improve fisheries habitat. In streams with heavy sediment loads this can change channel dynamics and create channel instability if debris dams occur. Through the development of the TMDL Implementation Plan, developed after the TMDL Load Allocation, it may be identified that water quality may benefit from management activities related to beaver density and large woody debris recruitment.

Warm Spring Creek does appear to have some similarity to Challis Creek, particularly with geology. A couple important differences seem to be that Warm Spring Creek appears to have a higher drainage density with a north west aspect, and that it is on the more precipitous side of Twin Peaks at a higher average elevation with a predominantly north west aspect. It makes its confluence at approximately 6,000 ft, where the Challis Creek confluence is at about 4800 ft. The TMDL for the hydrologic unit that contains Warm Springs Creek will be due in 2005. It will be interesting to compare them in greater detail. Perhaps the greatest difference is that Challis Creek is on the 303(d) list and Warm Springs Creek is not.

Your suggestion to perform a microscopic examination of the sediments of the lower channel to identify sources may be useful to identifying potential reductions in the implementation plan, and may also identify the potential for additional sediment reductions. Neither DEQ or EPA has a protocol for carbon dating organic material from ancient abandoned stream channels to evaluate sediment loads, but perhaps there is some literature that will describe such a strategy so that it can be evaluated for future incorporation into the Water Body Assessment Guidance. The Water Body Assessment Guidance is a document put together by DEQ to evaluate the beneficial use support status of surface waters in Idaho.

Comments from BLM: Challis Field Office (response in bold print)

BLM Challis Field Office Comments

Following are comments regarding the January 2002 draft of the Upper Salmon River Subbasin Assessment and TMDL:

- Supporting data is needed for the comment on page 13 that"…most rainbow trout surveyed are likely residents isolated by irrigation diversion structures."

Many tributaries to the Salmon River are disconnected through much of the year by dewatering from diversion. Many of the disconnected tributaries have salmonid populations above dewatered sections that may periodically have access to the mainstem Salmon River but are considered isolated during critical life history stages such as spawning or during times when tributaries would provide thermal refuge to adults and young. This condition is well recognized by fisheries professionals working in the Upper Salmon basin and is described in numerous publications.

The context of the sentence that you partially quote is to distinguish between wild steelhead and resident rainbow trout collected in surveys. The intent is to show that most surveys do not distinguish between juvenile steelhead and rainbow, and that rainbow populations are often isolated. We will clarify this by inserting "…potentially isolated by irrigation diversion structures."

- Pine Creek in the East Fork Salmon is not "known to contain bull trout" by the BLM (page 32).

This section will be edited to incorporate this change.

- The locations of irrigation diversions in Road Creek need to be clarified.

A description will be included that identifies the lower private/BLM boundary. The boundary in question is 4,800 feet above the confluence of Road Creek with the Salmon River. This is the point where the western edge of section 19 intersects Road Creek. From this point to the confluence will be listed for flow alteration. Above this boundary is where the diversions are.

- Characterization of Kinnickinic Creek should to be updated throughout the document to include reference to the EPA remediation completed in October 2001.

DEQ has requested a narrative description of this remediation project several times directly from EPA and BLM on site, and during follow-up discussions. At this time no summary of this project has been received beyond that included in the document. DEQ has conducted follow-up monitoring in April 2002 and found that there has been a net reduction in zinc loading to below criteria and the zinc TMDL will be removed from the Upper Salmon Subbasin Assessment and TMDL.

- Note should be made that the Kinnickinic Creek hydro power plant was modified in 2001 such that it no longer dewaters the stream.

Recent site visits by DEQ in April and May 2002 does show that the diversion has been modified, and it appears that it is no longer possible to divert water or to dewater the stream. It is evident that the stream will have increased flow. Additional water column samples, collected for zinc, show that during base flow, when zinc loading would be expected to be the highest, zinc levels are below acute and chronic water quality criteria. The subbasin Assessment will be updated to reflect this new information and the TMDL will be removed for Kinnikinic Creek.

- Characterization of Kinnickinic Creek should be clarified to note that the TMDL for zinc was assigned after the EPA corrective action was taken.

It should be noted that the corrective action was designed to isolate Kinnikinic Creek from contact with the tailings pile and reduce the potential for mass failure and erosion of the tailings and continued release of tailings pile fines to the surrounding environment via wind and hydraulic erosion. The design did not incorporate specific features to reduce or eliminate metals loading into Kinnikinic Creek, though a reduction in metals loading appears to have accrued. It may be that the additional flow that results from decommissioning the hydroelectric diversion has helped as much as the remediation project. The additional flow is expected to benefit fisheries and coldwater biota as well.

- The Kinnikinic Creek sampling site mentioned in paragraph 1 page 56 is above the Clayton Silver Mine Tailings site.

This section will be edited to incorporate this addition.

- Big Boulder Creek restoration by the Shoshone-Bannock Tribes and Bonneville Power Administration was completed in 1997 (page 35).

This section will be edited to incorporate this addition.

- On Page 44, it is stated "Road Creek will be listed for flow alteration from the lower private/BLM boundary downstream to the confluence with the Salmon River…" This appears to be an error, and should be "Road Creek will be listed for flow alteration from the lower private/BLM boundary downstream to the confluence with the East Fork Salmon River…".

This section will be edited to incorporate this change.

- The characterization of many sub-watersheds reviewed in the document focuses on National Forest lands and privately-held lands, and offers substantially less description of lands administered by the Bureau of Land Management. In sub-watersheds where the BLM is a major land holder, such characterization tends to give a skewed critique of the sub-watershed as a whole. Generally, lowlands and lowland waterways need greater detail of characterization in the document.

The Subbasin Assessment and TMDL are based on materials submitted to DEQ as a result of written request from DEQ to land and resource management agencies in the Upper Salmon River Watershed for any and all data that pertains to water quality within the Upper Salmon River watershed for use in developing the Subbasin Assessment and TMDL. There are several documents that have been accumulated as a result of this request for data. The Forest Service wrote some, some were written by BLM, and some were developed by committees that incorporated representatives from many agencies. All of the pertinent materials submitted were incorporated by DEQ Technical Services in development of the document. Additionally, through land and resource management agencies participation in the Challis Experimental Stewardship Group, the Watershed Advisory Group for the Upper Salmon River watershed, requests for materials were made repeatedly. Updates on the development of the document were provided to the group, and the draft Subbasin Assessment was provided to BLM a full year before the draft TMDL was added to the document for public review. During that year no additional description of BLM land or water quality data was received, nor was any concern voiced that BLM land management was under represented in the Subbasin Assessment.

- Maps of sub-watersheds are needed, especially in instances where stream reaches are described by location relative to named stream tributaries.

Watershed maps are included on page 10, 16, and 38. Additional watershed maps will be developed for streams that have had TMDLs prepared.

Challis Field Office of the BLM is in the process of identifying additional data sources that DEQ may find useful for the TMDL. Specific data are:

- Functionality reviews in the Ellis Creek sub-watershed.
- Temperature data from 2000 and 2001 for Squaw Creek.

- Clarification of the Horse Basin Creek and Road Creek stream temperature data and standards (page 33) as discussed in BLM's Biological Assessment for the East Fork Salmon River Section 7 watershed.

Thank you for this opportunity for involvement in the Upper Salmon River Subbasin Assessment and TMDL process.

No additional data has been received by DEQ up to the time the final document was submitted to EPA.

Comments by Challis and Yankee Fork Ranger Districts (response in bold print)

02-28-02
USDA Forest Service COMMENTS to

DRAFT Upper Salmon River Subbasin Assessment and TMDL

General Comments:

1) We would like to see this document used as a framework for fixing problems, rather than exposing any entity or land user to blame. Some of the phrasing and selected quotations appear to focus on the latter.
2) We see a need to include <u>percentage</u> of road, or roadless area and any wilderness acreage in descriptions of subwatersheds, rather than miles of road.
3) Discussions concerning grazing are inconsistent. You have used site specific examples for certain watersheds but not for others. A more general approach is needed due to the fact that we now have PacFish standards to adhere to. You should cite the PacFish Implementation Monitoring Report. Also, there is a need to mention that trends exist and historic abuses are lessening.
4) You need to include more mention of the influence of wildfire. For example, the Rankin overburn of the earlier E. Basin Burn has affected sediment delivery to streams in the Yankee Fork watershed, at least intermittently.
5) Cross-referencing of problems in the document could be better tracked between various sections.

Response to General Comments

The intent of the Upper Salmon River Subbasin Assessment and TMDL is to assess the condition of the Upper Salmon River Subbasin based on existing data submitted to DEQ from the request for water quality related data that was sent to the Salmon-Challis National Forest early in 2000. The breakdown of road and grazing data reflects the data submitted to DEQ based on the request. Data that shows the percentage of roaded and roadless areas by subwatershed would be useful, however DEQ did not receive this data with the requested water quality data.

DEQ discussed the development of the Subbasin Assessment and TMDL at

Challis Experimental Stewardship Group meetings during 2000 and 2001, and repeatedly requested updated water quality information from land management agencies. To date no data or information has been received regarding specific fire related water quality monitoring data.

The TMDL will be reviewed with your comments in mind, and where ever possible edits will be made to incorporate your suggestions. It should be noted by the Salmon-Challis National Forest, however that the State of Idaho

is preparing TMDLs on a court ordered timeline and delaying the schedule to incorporate data that has not been provided to DEQ in a timely manner is not an option.

Comments pertaining to specific pages : (*Note : suggested added wording is italicised*.)

Executive Summary :
1st Paragraph, 2nd Sentence ,should include "cumulative effects of mining, warm season grazing, ***grazing over-utilization of riparian areas***, timber harvest and associated roads, ***where they have occurred in river bottoms***…"

The additions will be made to reflect grazing over-utilization of riparian areas, though the effect of sediment from roads is not always limited to roads that occur directly in river bottoms.

Parag 2, last sentence : need to add, at end of sentence :
"Challis Creek and Kinnikinic Creek watersheds , ***and virtually everywhere diversions exist within the subbasin***."

This paragraph relates to the lack of beneficial use support within these two particular creeks. Though, as you state, there may be sources of sediment at virtually every diversion within the subbasin, Challis Creek and Kinnikinic Creek are the two streams identified in the Subbasin Assessment as not fully supporting beneficial uses that will have a TMDL developed.

Page 1
Para 1, Sentence 5 : "The Eastern boundary runs along ***the north end of*** the Lost River Mountains, ***otherwise known as the Pahsimeroi Mountains***."

Sentence 6 will be changed to reflect that The Eastern boundary runs along the Pahsimeroi Mountains of the Lost River Range.

Page 4
Para 2, Sentence 2 should read "***The Challis Volcanics include a series of widespread lava eruptions beginning about 51 million years ago, followed by violent rhyolitic ash-flow eruptions from caldera complexes starting about 48 m.y.*** The volcanics overlie

much of the Precambrian and Paleozoic complexes within the subbasin***, and erupted from various calderas north and west of (and including) the Twin Peaks Caldera."***

Sentence 2 and 3 will be changed to incorporate this addition.

Para 3, 1st sentence should read "***Paleozoic complexes and minor Challis Volcanics*** dominate the Lost River Mountain Range (Pahsimeroi Mountains) along the eastern border of the subbasin."

Sentence 1 will be changed to incorporate this addition.

Page 5

First full paragraph : Sent. 2 : "The Salmon river….flows through narrow V-shaped valleys ***as well as intermittent open valleys***…"

Sentence 2 will be changed to incorporate this addition.

Page 8

Para 2, Sent 6 : Grouse Creek is no longer an active mine.
Para 3, Sent 6 : " …Allotment Management Plan administered by ***both*** the BLM ***and the USDA Forest Service***."

Sentence 2 will be changed to show that Grouse Creek is no longer active.
Sentence 6 will be changed to incorporate this addition.

Page 9

First full paragraph : " The East Fork of the Salmon River is the largest contibutor" **of what ??** "to the Salmon River within the subbasin."…Last Sentence should read : "***Many*** tributaries to the Salmon river are relatively small with steep gradients."

Sentence 1 will be changed to show that the East Fork is the largest tributary to the Salmon river in the Upper Salmon Subbasin. Sentence 3 will be changed to incorporate this addition.

Page 11

First Sentence **: "…**throughout the subbasin**,** ***but only two remain active*** during the high flow season…" (These are located at Thompson Creek and on the Salmon River below Yankee Fork). **Need to add data for Thompson Creek (ie tributary gages) to Table 1. Also please note : maximum flow listed in Table 1 for Salmon river below Valley Creek does not apparently match the values in USGS chart on pg 139 which portrays daily values for various stations.**

Sentence 1 will be updated to incorporate this change. Table 1 refers to data for the Salmon River and does not include tributaries. Data in Table 1 represents average annual, minimum average annual and maximum average annual flow and is not intended to reflect the chart on page 139.

Page 12

Para 1, Sent 6 : should read " ***mine activity and mine waste***": rather than "mine tailings".

Sentence 6 will be changed to include mine tailings and waste rock.

Para 3 under Fish : Sent. 4 should read "In the SNRA ***and Salmon-Challis NF***…"

Paragraph 4 Sentence 4 will be changed to incorporate this addition.

Page 14

1st partial Para, 2nd Sent. : Please note : We have records of sturgeon in the salmon River upstream as far as Clayton ca. 1996.

The sentence will be changed to reflect the presence of white sturgeon in the Salmon River as far upstream as Clayton, Idaho in 1996.

Second full Para., Last sentence : Need to quote more than just the SNRA document when listing campgorunds and rec sites ; need to include BLM's sites at the mouth of E. Fork and Bayhorse and Cottonwood Campground as well !

BLM Campgrounds will be added to this paragraph.

3rd full Para, Last sentence : should read **"…, and which is mainly derived from Challis Volcanic rhyolite or Idaho Batholith granitic material."**

The last sentence will be changed to incorporate this addition.

Page 15

1st Para, Sent. 2 **: "**Riparian and floodplain areas have been highly modified by ***the location of State Highway 75, as well as by*** agricultural activities and bank stability structures…"

State Highway 75 will be inserted to be more directily associated with bank stability structures.

Para 2, last sentence : should include peak flow data citations.

USGS citations will be added to the last sentence.

Page 17

Last Para, Sent. 2 : Could be modified to : "Challis Creek originates in near vertical headwall cirque basins ***carved out of Challis Volcanics*** at elevations near 10,000 feet."

Sentence 2 will be changed to incorporate this addition.

Page 18

Para 2, Last sent : should be modified to : "Observations by DEQ and affiliated contractors have noted significant ***past*** beaver activity just below the confluence of Bear Creek***, and current activity below the confluence of Lodgepole Creek***, that may be having an impact upon channel dynamics."

The last sentence will be changed to read :…significant beaver activity just below the confluence of Bear Creek and Lodgepole Creek that may be having an impact on channel dynamics as a result of heavy sediment and bedload deposition.

Page 19

Last Para, Sent. 7 : should read "…miles west of the ***mine*** site." since it just stated that the location of the mill site is unknown.

Sentence 7 will be changed to read : The mine is located at approximately 8,000 ft elevation approximately 0.3 miles west of Keystone Gulch.

Page 20

Para 3, Sent. 3 : why isn't Bayhorse on the list for flow alteration and/or possible metals contamination ?

Bayhorse Creek is listed as fully supporting beneficial uses at the sites that have been assessed. The USDA FS, 1999b citation indicates the possibility of heavy metal leaching exists, however no data has been provided to show that criteria violations have occurred, and if leaching does occur, apparently leaching above 6,760 ft elevation is not significant enough to alter beneficial use support.

Last Para : Has DEQ considered the mine drainage in lower Sullivan Creek for possible metals loading ? Workings are located immediate above the private land boundary.

Sullivan Creek does not have adequate flow to be evaluated by the BURP process. DEQ did not receive any water quality data to indicate that metals loading is a water quality issue on Sullivan Creek.

Page 21

1st full Para, Last Sent. : Inconsistency in the document, because on page 48, it says DEQ sampled and found cutthroat trout in Kinnickinic. According to USDA FS data, there are no bull trout in Kinnikinic Creek, on mainstream and tribs above the Forest boundary. Furthermore, it may be questioned whether or not Kinnickinc is a a bull-trout recovery opportunity at all, even after loading reduction is achieved, due to the enduring low-functionality of the channel dynamics and presence of tailings fines throughout the lower reach streambanks.

DEQ did collect cutthroat trout in Kinnikinic Creek as indicated on page 48.

The BLM Biological Assessment for Bull Trout in the Section 7 Subwatershed Lower Canyon East Fork Salmon River Through Peach Creek 1998, (BALCEF) states that : Five streams within the watershed have known bull trout populations : Slate, Holman, Kinnikinic, Squaw and Thompson Creeks. A majority of the occupied habitat is on land administered by the USDA FS, Salmon-Challis National Forest and Sawtooth National Forests. A citation to the Upper Salmon River Bull Trout Key Watershed Problem Assessment will be added to the text that states that bull trout are present in Kinnikinic Creek.

Additionally, follow-up sampling in May 2002 by DEQ shows that sediment from tailings deposition was incorporating into streambanks and streambanks were quite stable overall. Water column sampling during base flow conditions in April 2002 show that instream concentrations of zinc were below water quality criteria.

Page 22

Para 2, last Sent. : ("…Personal Communication, ***with reference to the Thompson Creek Mine/IDF&G temperature study"***).

The last sentence of paragraph 1 will be changed to incorporate this addition.

Para 4, Last Sent. : Should read " Thompson Creek contains bull trout (USDA FS,…), ***and all other known species in the area".***
Para 5, Sent. 2 : should read "grazing on a ***two-year*** cycle."

The last sentence of paragraph 3 will be changed to incorporate this addition.

Page 23

Para 3, 1st Sent. : "irrigation diversion…is no longer actively used." ***Please note that USDA FS personnel witnessed active backhoe maintenance of that diversion during the summer of 2000.***

On site visits in the fall and summer of 2001 it did not appear that the diversion has been used. DEQ will continue to monitor the use of this diversion and it's effect on flow at the confluence with the Salmon River.

Page 24

2nd full Para, Sent. 4 **:** Note that the lower mainstem Yankee Fork is NOT a braided channel.

Sentence 4 will be edited to incorporate this change.

3rd full Para., Sent 4 : should read **"**addressed through a consent agreement ***with USDA FS and EPA*** under the federal**…"**

Sentence 4 will be edited to read:"… addressed through a consent agreement between EPA and USDA FS…".

Page 25
Last sentence on page ***:*** This sentence is out of place and instead, it belongs in the section on the Yankee Fork, on previous page. HOWEVER, PLEASE NOTE: This sentence says « presumed » and it is just that, conjecture. It is a quote from an SNRA bull trout BA, but is not based upon data. It needs to be recognized in this subbasin TMDL assessment that occaisional sediment loading from Yankee Fork (and many other drainages) pulses through to the Salmon River immediately following localised intense precipitation. This sort of loading is not due to human causes, but is a regularly recurring natural characteristic of the local climate, geology, gradient and soemtimes wildfire.

This sentence would be better positioned in the Yankee Fork section. The context of the sentence written by the SNRA Forest Service Hydrologist in the bull trout Biological Assessment is to acknowledge that the purturbation of the Yankee Fork channel due to dredge mining has dramatically increased sediment delivery to the Salmon River from this system. You are surmizing that the sediment production of the Yankee Fork is not related to anthropogenic causes, but is comparable with other local drainages and is triggered by localized intense precipitation. While it is likely that localized intense precipitation causes increased sediment delivery to the Salmon River from the Yankee Fork and it's tributaries it is also likely that sediment delivery to the Salmon River is exacerbated by human causes and is related to snowmelt as well as localized intense precipitation. The SNRA statement should not be taken out of context. It is only meant as a qualitative characterization, not based on data, as stated. The last sentence will be moved to the Yankee Fork section.

Page 26
Para 2, Sentence 2 : Salmon and steelhead are known to be present.
Sentence 2 will be changed to incorporate this data.

Para 4 Sentence 2 : No dredge proposals are active except for possibly one. This would be for SMALL SCALE, local activity with a portable unit.

Sentence 4 will be changed to show that there is currently an active suction dredge proposal based on updated Forest Service information.

Para 4, Note 2 : Rather than just listing the miles of roads in Basin Creek or any other drainage, it would be more appropriate to report the **road DENSITY statistic(s**).

Road density data is included where it is available.

Page 32
Para 5, Sent. 4 Contrary to info in BLM reference 1999a, McDonald and Pine Creeks contain cutthroats, but NOT bull trout (Ken Rodgers, Pers. Communication).

Sentence 5 will be edited to incorporate this change.

Page 33

1st full Para, Sent. 7 : Question appropriateness of using Corral Creek of E. Fork as an exceptionally damaged area. The area referred to is a 10-foot bluegrass/willow bench, and may exhibit the same usage as every other bench in the entire Salmon subbasin. **BLM characterization of this riparian area in the subbasin assessment is as heavily grazed, not exceptionally damaged.**

Page 34

Para 3, Sent.4 : Percent fines standard for the Challis zone of the Salmon-Challis National Forest is **30%, and not 20%.**

Sentence 4 will be edited to incorporate this change.

Page 35

1st Para., Last Sent : Bull trout are known to exist in Bowery Creek as well.

Bowery Creek will be added to the last sentence.

Para 2 : 2nd to last sentence , re. Sheep Creek, probably the entire surounding area has been grazed, rather than just Sheep Creek.

Boulder Creek Watershed will be added to the 2nd to last sentence.

Page 37,

Table 3 : Need to clarify that this is an originally-proposed list and is not current.

The list is the current 1998 303(d) list from which the court ordered TMDL schedule was developed. That schedule pertains to the 1998 list through 2006.

Page 42

1st Para under Garden Creek : Would it be possible to perform nutrients testing somewhere above the city boundary when time/funds are available ? There are visual indicators (such as algae) of possible nutrient "exceedence" at various locations through the private lands.

DEQ Narrative Water Quality Standards are based on nuisance levels of nutrients, and no exceedence was observed in surveys. DEQ did not have access to private lands during the development of the Subbasin Assessment, however there was no indication that nuisance levels have accrued within the channel. Future sampling would depend upon access to private land.

Note : The Salmon-Challis National Forest Watershed and Fisheries Monitoring and Completion Report (2000), states : " …observed substrate capability levels on South Zone streams showed a noticeable improvement relative to 1999 levels, with 79 percent (37) of the 47 surveyed stations meeting the Challis National Forest LRMP sediment

standard of 30 percent fines at depth, compared to 64 percent of stations surveyed during 1999."

Noted.

Page 45

Para 2 : The Upper Salmon Subbasin and TMDL draft quotes from the USDA FS Challis Creek Watershed Analysis : "No new project activites…should proceed in the watershed until base level aquatic inventories are completed in that portion of the wateershed that would be immendiately impacted by the proposed activity." Please note that watershed analysis documents are not decision documents, but present recommendations to management.

Noted. DEQ supports that recommendation to USDA FS management with the Challis Creek TMDL, which is a decision document. DEQ has not received any data to indicate that the base level aquatic inventories have been initiated or completed.

From **page 44**, at Para 2, Sent 2 : "Core sampling of depth fines above 40%…" While you are quoting from the Challis Creek Watershed Analysis, you should note that on page V-2 of that document, under Recommendation #5 (bottom of page) it states **:**

> "Amend the Forest Plan to include a range of fines at depth that represent the geology and site conditions for the Forest… Management Objective : To have standards and guidelines that reflect a natural and achievable range for the forest. The Forest Plan standard and guideline to limit the amount of fine sediment at depth to 30% or less is not within the historic range of natural variability for the site on Challis Creek. It is recommended that the Forst Plan be amended to include a wide range of fines at depth(s) that represent the different geology and site conditions."

Another comment: Both decadent and current beaver dam complexes operate as traps for fine sediments on Challis Creek. These sediments are periodically released to be transported through hydrologic systems by natural occurrences such as rapid snowmelt, storm events or fires followed by storm events, besides any channel instability caused by human uses. Natural disturbances have a higher likelihood of occurrence where the parent geologic material and soils are unconsolidated such as they are in much of the Challis Volcanics surrounding the Twin Peaks caldera complex, at the headwaters of Challis Creek.

The literature on the effect of fine sediment on fish spawning and survival is significant and widely accepted by fisheries professionals. Anadromous and resident fish species have been historically present within the Challis Creek watershed and numerous other watersheds on the Salmon-Challis National Forest that are found in volcanic geology with beavers. The Objective of the TMDL is to restore beneficial use support for salmonid spawning and coldwater biota, which have historically been fully supported throughout the watershed. The TMDL target

for fine sediment at depth is 28% within spawning habitat for resident and anadromous fish.

The functions of beaver dams are well known, and it is intuitive that in watersheds where sediment production has increased as a result of management activities that mechanisms that naturally trap sediment may be perturbed. Sediment delivery pulses may not necessarily be a result of the beaver dam combined with climatic pulses, but perhaps the elevated sediment load that has accumulated above the impoundment.
For example, the Mosquito Flat landslide has been contributing large amounts of sediment to Challis Creek for many years, yet there has been no apparent effort to stabilize this feature or to reduce sediment production to the stream. This feature may well have been the source of the materials that are now observed choking beaver dams downstream.

Table 7. Challis Creek BURP Assessment indicates that the requirements of the Clean Water Act are being met in Challis Creek drainage at this time.

Table 7 indicates that Cold Water Biota is not fully supported in Challis Creek above Mill Creek, as described in the text for that section.

Page 49
Relative to Para 1 : There is also a fish migration barrier at the mouth of Kinnikinic Creek, where it enters the Salmon River. Even though BMP's have been accomplished for the channel, habitat alteration remains a problem.
Noted.

Page 52
Last Para, 1st Sent. : "based on USDA FS fieldwork" should instead read " ***based upon A Idaho Fish & Game study in coordination with Thompson Creek Mine."***

The 1st sentence will be removed because Fish and Game has not identified a directed study in coordination with Thompson Creek Mine, and has no knowledge of any such study.

Page 62
In section entitled **Yankee Fork**, mention should be made of the lower Jordan Creek wetlands and stream channel restoration undertaken by Hecla, 1997 to 1999.

This project will be mentioned.

Pages 66-67, 68
Water quality target of 28% fines sediment load allocation may be unrealistic, for reasons stated above.

See response to comment based on Page 44 above.

Page 160
" Lateral Recession Rate" We would like to see what "factors" were used to determine these critical values, used in your tons/year bank erosion calculations. You state that they are derived from NRCS, based upon Pfankuch, but do not cite a specific NRCS protocol document. This is critical to verifying that your method provides reproducible results, in order to track improvement from year to year. Also, it would be helpful to know which stream reaches of Challis Creek were used to make these determinations.

The factors are shown on page 156-157. The relationship between Pfankuch and the NRCS rating system is described on 157. It is not based on Pfankuch, however a cross-reference is provided. The NRCS has not has not identified a specific protocol document pertaining to the erosion inventory. Methodology is taken from an NRCS Memorandum describing estimation of streambank, road and gully erosion; adapted from the Channel Evaluation Workshop held in Ventura, California in 1983. This methodology was adopted for use in TMDLs where there is not existing data on sediment loads. It is intended to develop a gross allocation, which is permissible in developing TMDLs when better data does not exist and there is a strict timeline to do a load allocation. It is not intended to be a tool to monitor streambank condition on a yearly basis. The citation for the memo and Channel Evaluation Workshop will be added to the Literature Cited section.

1st Para, 1st Sent. under " Field Methods" : Usual McNeil depth fines protocol requires a 6-inch cylinder insertion depth in anadromous spawning gravels, and a 4-inch depth for resident population spawning sites. DEQ's crew used a 4-inch depth, but Challis Creek is historically an anadromous watershed.

The primary use of Challis Creek is currently by resident species. Existing USDA FS data also shows excessive depth fines to a depth of 6 inches. The Contract data was collected to a depth of 4 inches in order to index more sites throughout the watershed. The target of 28% fines less than 6.35 mm will be adequate to show an improving trend in fine sediment deposition. If the USDA FS attains their standard target at a depth of 6 inches, it is likely that the 4-inch target will also be attained. Beneficial use support of Salmonid Spawning and Coldwater Biota will likely be met at the stated target.

Supplemental USDA FS Comments

Page 24
Para 3, 5th sentence: Administrative Order of Consent (AOC) is with USDA FS and EPA Sentence should read as follows: Additionally, discharge from a leaking tailings impoundment is being addressed through a Administrative Order of Consent (AOC) for Time Critical Removal Action with USDA FS and EPA, under the federal Comprehensive Environmental Response, Compensation, and Liabilty Act (CERCLA), There is also an Consent Order with the State of Idaho, DEQ. The State has established that implementation of the AOC will fulfill the requirements of the State Consent Order.

This started off as time critical, but its current status is no longer time critical. Currently Hecla is conducting an Engineering Evaluation/Cost Analysis (EE/CA) under CERCLA.

Page 26
Para 2, 1st & 2nd sentences: need to add East Basin Creek, Coal Creek, Kelly Creek, and Little Basin Creek to the list of streams where bull trout were observed. Besides westslope cutthroat trout, mountain whitefish and sculpin are also known to occupy streams in the sub watershed. (USDA FS, 1998 in your reference list)

The streams and species in your comment will be added to the text.

Para 3: depth fines mean ranges from 13.5-33.3%, USDA FS, 2001, for 1995-2000, rather than 22-23%. Also, maximum 7-day running avg. temp (from 2001 field season) was 20 degrees C at the S-C/SNRA forest boundary.

The range of depth fines will be added to the stated average. Your statement about temperature will be added to the text.

Page 32
Para. 5, sentence 4: Additional reference for bull trout absence in McDonald and Pine Creek is Inland West Biotic Component Database (USDA FS 2000).

The BLM statement that bull trout are present in McDonald and Pine Creeks will be removed and your citation for absence will be added.

Page 34
Para 3, sentence 1: Brook trout present in Herd Creek (USDA FS 2000)
Sentences 2 & 3: bull trout are **not** present in East Fork Herd Creek, brook trout are **not** present in East Pass Creek (USDA FS, 1997a on pages 50-51).

Brook trout will be added to Herd Creek, bull trout will be removed from the East Fork of Herd Creek, brook trout will be removed from East Pass Creek.

Para 3, sentence 4: percent fines at depth for East Pass Creek ranged from 27.1 to 38.8 percent (USDA, 2001) and Herd Creek below E. Pass Creek confluence, range is 28.4 to 32.5%. West Fork Herd Creek: 20.4 to 27.2 depth fines.
These ranges of data will be worked into the text.

Para 3, sentence 8: maximum 7-day water temp in upper Herd Creek in 2001, upper Herd and E. Pass Creek was 14.4 degrees C. (USDA FS 2001).

These ranges of data will be worked into the text.

Pages 41-42

Please note that federal temp criteria for bull trout is listed as 10 degrees C as a 7-day MOVING AVERAGE, whereas the DEQ criteria is a DAILY MAXIMUM. This makes comparison difficult; suggest these need to be consistent in the document.

The current Idaho salmonid spawning and cold water aquatic life criteria are based on Daily Maximum (also referred to as instantaneous maximum) and Daily Average. The state criteria for bull trout spawning and rearing, howerver are based on Maximum *Weekly* Maximum Temperature (MWMT) and DAILY AVERAGE. The MWMT is the mean of daily maximum water temperatures measured over the annual warmest consecutive seven (7) day period occurring during a given year. The federal bull trout criterion is as a Seven-Day Moving Average of Daily Maximum Temperature.

Page 45
Table 7: supplemental comments to our initial response…why is a TMDL needed for Challis Creek if the BURP Assessment shows beneficial uses are fully supported?

As stated in the response to your initial comment: the BURP Assessment shows beneficial uses are not fully supported. With a macroinvertebrate score less than 3.5 the status becomes Needs Verification, which is less than Full Support, and requires a Total Maximum Daily Load to restore beneficial uses.

Page 58
Assessment Data Gaps:

What efforts will be taken to determine presence or extent of metals contamination occurring from mine drainage on Bayhorse and Sullivan Creeks? (see initial S-C National Forest Comments for Page 20 of the draft assessment and TMDL).

See DEQ response to initial S-C National Forrest Comments for Page 20 of the draft assessment ant TMDL.

Page 62
In continuation of discussion in section entitled **Thompson Creek**: In 1992 restoration work at Scheelite Jim millsite consisted of tailings isolation from the creek, streambank armoring, site cleanup and surface stabilization/revegetation. Creation of functional wetlands to trap heavy metals and ARD from the tailings site to further improve water quality occurred in 1999.

During an on-site visit with the Forest Service Mining Engineering Technician that had coordinated much of the restoration work DEQ was advised that the restoration work was begun in 1991 and 1992 and supplemental work was completed in 1999. A narrative summary of the project was received by DEQ in May 2002. The introduction states…"Ground work was started in the summer of 1991 by heavy equipment and operators from the Cyprus Mine, and work was completed in the fall of 1992. During the tailings reclamation in 1991 and 1992, seven wetland cells were

constructed along the east side and south end of the recontoured tailings. Twenty tons of old hay and straw were placed at the bottom of the cells to help create an organic growth medium for future wetland plant species." The delivery of this document to DEQ was delayed by your review. Your comment contradicts what is written in the document.

Section entitled **Yankee Fork:** correct date for wetland and stream channel restoration undertaken by Hecla on lower Jordan Creek is 1993 instead of 1997 to 1999 mentioned in our initial comments.

Noted.

Pages 65-68
Challis Creek TMDL

Discussions in this section emphasize attainment of a water quality target of 28% or less depth fines consistent with "…values measured and set by local land management agencies". What/who's standard or target is appropriate for the §303(d) listed reach which is identified as "Forest boundary to Salmon River" in the Executive Summary? This reach is almost entirely within private lands as the assessment acknowledges. The Salmon-Challis NF sediment depth fine standard of 30% or less has been questioned for appropriateness in our previous comments based on the geologic characteristics of the Challis Creek drainage. In addition the depth fines monitoring site utilized by the Forest may not be adequately describing the conditions and trend immediately upstream of the listed reach. Data suggest a significant decrease in depth fines from 1995 to 1999 (Table 18, page 55), but the Forest has reported the core sampling site as not representative of spawning gravels. The site is located within the stream reach containing beaver dam complexes and the Forest recommends adding a new monitoring site indicative of the beneficial use: salmonid spawning (USDA FS, 1997b, Chapter IV-2, Chapter V-2).

The TMDL will use the 28% target on the private land reach below public land as well. This target has been used by DEQ and approved by EPA within other similar watersheds with volcanic geology. As stated in the TMDL this target is applied to spawning habitat, not a general substrate condition over the entire reach. If naturally occurring spawning habitat diminishes progressively downstream then the target does not apply. Land management activities should reflect the sensitivity of the native geology and in-stream spawning habitat, particularly where threatened and endangered species listings are involved. It is felt that depth fines in spawning habitat can ultimately improve to within the range of the target, or to a level that allows for full support of beneficial uses.

If, as stated in your comment, a decreasing trend in fine sediment in spawning habitat has been observed within a beaver complex then the potential for improved conditions exists in other less depositional habitats. There is potential for spawning habitat within beaver dam systems, it is dynamic with the changing conditions of the

system. If you are not sampling spawning habitat for depth fines, then perhaps it would be best to not group that data with spawning habitat samples.
Attainment of 80% bank stability and associated rate of stream bank erosion for Challis Creek may be an appropriate goal based on natural condition database comparisons. The sediment load estimates and allocations presented in Table 21, page 67 and the assumptions, protocols and inventory techniques presented in Appendix I, pages 155-166 are items we wish to offer additional comment on (Please note that inclusion of the map of inventory reaches, road segments referenced on page 67 in the Draft Assessment and TMDL would have been of great help to reviewers):

Roads – The Forest acknowledges sediment contribution of roads as in the case where they parallel streams such as Challis Creek. The assumption of 32 inches annual precipitation used with the WEPP model in determining the existing erosion rate is unrealistic. An annual precip. Assumption of 16 inches would be generous in the instance of this location. We realize the rationale behind a margin of safety and need for conservative estimate of erosion load, but we also foresee the need for achievable targets for sediment reduction. Further application of standard BMP's and surfacing improvements are possible types of actions reasonable for the Forest to undertake. How do you propose quantifying actual reduction in sediment contribution from roads following changes or improvements?

A map will be included in the final document. Road inventories are intended to be gross allocations for comparison with streambank erosion. The contribution, even if it is over estimated, shows only 3 percent of the total load allocation for sediment. It is likely that if the proper BMPs for drainage, armoring and maintenance are in place on this road a significant reduction of sediment transport to Challis Creek will accrue. There are numerous road cuts and areas where the stream is eroding the road bed along the inventory reach. Reductions in sediment delivery will not be difficult to identify.

Ultimately improvements in sediment loading will be tracked through beneficial use support status. If Full Support is not attained, or if trends do not show improvement within a reasonable time then perhaps more vigorous implementation projects will be sought.

Stream banks - Existing and total erosion rate in Table 21 for the "Upper" Challis Creek stream reach is based on a short segment inventory (and subsequent projection to a much larger segment) which you have characterized as having 40% eroding bank. This stream reach is described generally as the portion of Challis Creek on the Forest from the road crossing below Mosquito Flat Reservoir downstream to the Forest boundary, minus the extensive beaver dam complexes within this reach. The subsequent worksheet calculation (page 164) results in this reach contributing 39% of the sediment loading for the Challis Creek TMDL (Table 21). This assessment is not supported by data gathered and analysis conducted by the Forest. Fish habitat surveys according to R1/R4 inventory protocols conducted by the Forest in 1993 on Challis Creek revealed a bank stability rating of 85% (USDA FS, 1994). Livestock use impacts, changes to riparian vegetation

indicative of declining conditions along Forest portions of Challis Creek have not been noted nor have any hydrologic events occurred in the ensuing period since the time of these habitat surveys.

The Challis Creek Watershed Analysis (USDA FS, 1997b) identifies the beaver dam complexes within this stream reach with braided channel, excessive bedload, high width to depth ratio and poorly developed floodplain as being a possible source of water quality impairment currently exiting this Forest portion of the subwatershed.

We suggest an on-site review of this reach of Challis Creek by DEQ and Forest personnel to resolve the discrepancies in our inventories and assessment of current conditions. Our mutual agreement on the source and extent of sediment related problems on National Forest portions of Challis Creek are essential to development of an accurate and realistic TMDL for this subwatershed by DEQ.

The inventoried reach is not extrapolated upstream above the Forest Service road crossing just above Lodgepole Creek. It does appear that streambank stability is higher above this road crossing and this is why a load allocation was not previously made above the road crossing. Additionally, as described in the inventory cross reference found in Appendix I, Forest Service bank stability ratings are different than that conducted in streambank erosion inventories. The overall sediment reduction in Challis Creek is small compared to many streams that have had sediment TMDLs prepared. Do not misconstrue 39% as an unrealistic allocation, the absolute difference in load reduction between 71 tons per mile per year and 36 tons per year is not unattainable. The differences between the erosion inventory and R1/R4 are not discrepancies, they are just different methodologies. Additionally, it may take many years after implementation of Best Management Practices to improve the conditions that the Forest Service sites in its Challis Creek Watershed Analysis. The conditions that are listed above are not typical of streams with beaver dam complexes in volcanic geology that are in balance with sediment load.

After reviewing your comments on the condition of streambanks on Challis Creek a third review of the upper contracted inventory reach was conducted and streambank stability was verified to be 45% unstable over the upper reach (55% bank stability). Additionally, evaluation of erosion conditions above the forest road crossing revealed the nature and extent of the Mosquito Flat Landslide. It appears that this is likely the primary source of sediment that has caused stream channel aggradation, and associated channel instability below the road crossing. It appears as though Challis Creek was able to transport the catastrophic sediment load to the depositional areas associated with the beaver complexes, which then resulted in channel aggradation and instability. It does not appear that there has been any effort to stabilize the landslide or to vegetate the erodable surface of the slide to reduce sedimentation of Challis Creek. It appears that there is some potential that the triggering mechanism could be related to placer mining activity that could have been exacerbated by occasional heavy releases from Mosquito Flat Reservoir, either

natural or management related. The net result is that the sediment load to Challis Creek will be increased to reflect the additional significant sediment sources that were not identified adequately in the Challis Creek Watershed Analysis.

Additional References Cited:

USDA FS. 1994. Chinook Salmon Biological Assessment for Ongoing and Proposed Activities within the Challis Section 7 Watershed on the Challis National Forest. Challis National Forest, Challis Ranger District.

USDA FS. 2000. Yankee Fork Ranger District Inland West Biotic Component – Fisheries Occurrence Database located at Rocky Research Station (http://fsweb.r4.fs.fed.us/unit/bpr/ iwwi.html#data_avail). Raw data is located at Salmon-Challis Nation Forest, Yankee Fork Ranger District.

USDA FS. 2001. Yankee Fork Ranger District Stream Temperature Graphs. Salmon-Challis National Forest, Yankee Fork Ranger District.

Comments by NMFS (response in bold)

The National Marine Fisheries Service (NMFS) would like to thank the Idaho Department of Environmental Quality (IDEQ) for this opportunity to provide comments on the Upper Salmon River subbasin assessment and Total Maximum Daily Load analysis (TMDL). NMFS would like to express special appreciation for IDEQ's extension of the comment period. The TMDL process, including subbasin assessments and locally authored implementation plans, provides a unique and vital opportunity to improve watershed health and speed recovery and delisting of ESA listed salmon and steelhead.

Federal agencies are required to consult with NMFS when their actions may adversely affect certain species listed under the Endangered Species Act (ESA). Federal actions subject to this examination include, but are not limited to, NEPA level projects, Federal approval of projects carried out by non-Federal agencies using Federal funds, and approval of non-Federal actions by federal agencies with regulatory oversight. This last category of Federal actions includes many Clean Water Act programs, such as discharge permits, 404(d) permitting, and TMDL approval. The United States Environmental Protection Agency is required, by federal law, to ensure that its discretionary approval of any TMDL will not jeopardize the existence of ESA listed species. These comments do not fulfill any obligation on the part of NMFS or the EPA regarding ESA consultation. They are intended only to communicate concerns the NMFS Boise field office has with the draft Upper Salmon River subbasin assessment and TMDL.

The Upper Salmon River Subbasin Assessment and Total Maximum Daily Load (TMDL) is not likely to adversely affect species listed under the Endangered Species Act.

NMFS has jurisdiction for three species of ESA listed salmon and steelhead in the Upper

Salmon River subbasin. Snake River sockeye salmon were listed as endangered under the ESA on November 20, 1991 (50 CFR § 224.101(a)). Critical habitat was designated on December 28, 1993 (50 USC § 226.205), and includes the Salmon River, Redfish, Alturas, Pettit, Yellow Belly, and Stanley lakes and their connecting tributaries. Snake River spring/summer chinook salmon were listed as threatened on April 22, 1992 (50 CFR § 223.102). Critical habitat was designated for this species on December 28, 1993 (50 USC § 226.205), and includes all reaches currently and historically accessible, excluding habitat above Hells Canyon and Grand Coulee dams. Snake River steelhead were listed as threatened on August 18, 1997 (50 CFR § 223.102). Critical habitat was designated on February 16, 2000 (50 CFR § 226.212), and includes all reaches currently and historically accessible, excluding habitat above Hells Canyon and Grand Coulee dams. The ESA is Federal legislation intended to protect and recover species in danger of extinction (endangered), or likely to become in danger of extinction (threatened). The ultimate goal of the ESA is to recover species to the point at which they no longer require protection under the ESA.

Each of these species has been in decline since before listing under the ESA. Analyses indicate significant gains must be made in early lifestage survival to reverse declining population trends. Perils faced by ESA listed salmon and steelhead in Idaho include: habitat destruction from development, agricultural and recreation use; water quality degradation from mining, road, and habitat alteration; lack of sufficient instream flows caused by water diversion; and loss of population integrity due to hatchery influence.

The TMDL as defined in the Clean Water Act is directed toward restoration of beneficial uses. The endpoint that TMDL targets and load allocations are directed toward is full support of beneficial uses including salmonid spawning and coldwater biota. Streams that demonstrate full support of designated or existing beneficial uses are removed from the 303(d) list and do not require development of TMDLs.

NMFS has commented on some of the proposed changes to the 303(d) status of reaches within this subbasin. Generally, it appears that a) data specific to salmon and steelhead habitat needs, such as substrate condition, are lacking, and b) the Beneficial Use Reconnaissance Program (BURP) does not adequately analyze habitat quality needed by ESA listed salmon and steelhead. These two issues are pervasive throughout the document, and form much of the basis for NMFS' concerns. NMFS also has specific data from Thompson Creek that may not have been available to IDEQ when preparing this document.

Aquatic habitat alteration is not a recognized pollutant for which a TMDL is prepared. The Subbasin Assessment is based on existing water quality data and supplemented, where possible, with additional data collected by DEQ. Issues that NMFS may have with the Beneficial Use Reconnaissance Program are programmatic issues that would be best dealt with through EPA.

Yankee Fork:

The Yankee Fork River was listed on the 1996 303(d) list for sediment and habitat alteration. This watershed assessment lists the Yankee Fork as being in "full support" of its designated uses, which include cold water aquatic life and salmonid spawning, and proposes the Yankee Fork be delisted. Habitat characteristics that influence salmon fry emergence, and therefore successful spawning, include dissolved oxygen, temperature, and percentage of fine sediment in spawning and incubation substrate. The physical impact of fine sediment is significant: fine sediment limits gravel interstitial space, removing available shelter and limiting oxygen saturation. Eggs and fry subjected to high fine sediment concentrations are literally suffocated. Emergent fry require interstitial space for shelter and feeding, space which is not available when fine sediment concentration increases.

The proposal is for the Yankee Fork to be listed for Habitat Alteration only. The biological signal is that the Yankee Fork is in Full Support of beneficial uses for coldwater biota and salmonid spawning. Full Support does not indicate that spawning habitat is in optimal condition. Purturbance of habitat is not a recognized pollutant for which a TMDL is prepared.

The watershed assessment cites % depth fines data prepared by the Salmon Challis National Forest, Yankee Fork Ranger District. Page 48 of the watershed assessment states that of five sampled sites, two had increasing fines trends, two had decreasing trends, and one site remained static. The authors point out that the increasing trend sites averaged 22 and 17 % over the five year sample period, and identify 27.5 and 24.2 as being the highest recorded percentages over that time period (although data presented on page 55 suggest 29.1 and 29.5 were the highest percentages sampled for those sites). Five year averages for each sample site are 23.8, 22, 17, 32.4, and 24.3% fines. Each surveyed site except Yankee Fork 5A contains fines at levels known to reduce chinook emergence. Spring/summer chinook emergence begins to be limited when fine concentrations reach 20%. Of the five areas sampled, all but one exceeds this number in both the five year average and most recent sample.

The text will be edited to show that 29.1 and 29.5 were the highest percentages sampled during 1996, and that most recently depth fines were below target levels. Target levels for fine sediment at depth are not intended to maximize spawning conditions, but to provide the potential for self sustaining production of salmonids. They are intended to meet the intent of the Clean Water Act, that waters of the United States be fishable and swimable. If water quality standards for 20% fines less than 6.35 mm are incorporated into state Water Quality Standards, or if beneficial use support is no longer used as a TMDL endpoint, a TMDL for the Yankee Fork of the Salmon River will be revisited. The potential does exist, however, for voluntary and cooperative projects among land and resource management agencies, and watershed stakeholders to improve water quality beyond that level required by the Clean Water Act.

According to the NMFS habitat matrix, substrate concentrations of 12 - 20% fines indicate an at risk watershed, and >20% indicate a not properly functioning watershed.

Recognizing that the Yankee Fork system has a very high natural background sediment contribution, the data provided still suggest impaired spawning habitat. Better characterization of the relationship between natural disturbance regimens and human disturbances should be made before these high concentrations of fine sediment can be discounted. Sediment "press" from human disturbance is a chronic problem in many sediment limited watersheds, halting or retarding overall improvement in sediment loads. The TMDL process can accurately identify what load reductions would be necessary to enhance beneficial use support (in this case, salmonid spawning), and promote identification of mechanisms to further reduce sediment loading and its subsequent adverse effects.

The NMFS habitat matrix is not currently incorporated into the state Water Quality Standards, or the Water Body Assessment Guidance. TMDLs are not currently prepared based on risk. They are intended to restore beneficial uses.

The evidence provided indicates the Yankee Fork River does not fully support salmonid spawning. BURP monitoring bases full support on the presence of fish from multiple size classes and macroinvertebrate biotic indices exceeding 3.5. Macroinvertebrate indices are able to detect changes in pollution and temperature at a gross scale. However, the finer and less evident effects of slight elevations in temperature on salmonid fish (e.g. reduced emergence) are not detectable through the relatively course filter of invertebrate indices. The BURP methodology does not directly assess the health or strength of salmonid populations, and thus cannot make definitive statements as to the level of support provided by a given stream. Gradual reductions in local populations are not detected by the BURP process, which provides more of a "population snapshot" rather than an assessment of population health. Salmon could continue to spawn, with less success, in impaired waters. Such a circumstance would not be identified through sole use of BURP findings. Full support for salmonid spawning would be more accurately demonstrated by assessing the quality of available spawning habitat and actual use of that habitat by juvenile and adult fish. Idaho water quality standards describe salmonid spawning beneficial use surface waters as "capable of supporting self-sustaining salmonid populations." Before sediment effects on spawning gravels can be discounted, IDEQ should examine spawning habitat and assess its quality. Then it can be determined whether available habitat is of sufficient quality to support "self-sustaining populations" and, if that habitat is not of sufficient quality, whether human pollutant contributions are responsible for the degradation.

Noted.

If such data are available to IDEQ, they should be presented in the watershed assessment. The data presented do not indicate the Yankee Fork River is in full support of salmonid spawning Data indicate the Yankee Fork remains sediment limited and would benefit from a TMDL. IDEQ identifies the Yankee Fork as a reach for which adequate data to evaluate pollutant loading do not exist. The BURP process does not adequately address the health of listed salmonid populations, and thus cannot provide assurance that the reach is in full support of its beneficial uses. IDEQ should retain this reach's 303(d)

listing until thorough data supporting its removal are available.

Thompson Creek:
Thompson Creek was listed for sediment and metals. The most impaired section of this creek is near the Scheelite Jim mill site, where acid rock drainage has contributed iron hydroxide loading to a significant section of the stream. The Salmon Challis National Forest has completed restoration activities at the mill site to mitigate the effect of mine tailings that contributed the probable pollutants.

The current subbasin watershed assessment provides no data addressing metals contamination. It is not clear from the current document if Thompson Creek is meeting water quality criteria for metals. BURP monitoring found communities of metals intolerant organisms. However, this is not an adequate substitute for direct measurement of dissolved or total metals in the water column.

NMFS also has concerns stemming from observations made at the reclamation site. A NMFS biologist and geochemist visited the Scheelite Jim mill site on August 28, 2001. Where tailings were removed as part of the cleanup effort, they observed an off-white precipitate on the surface of the ground at the same elevation as the road. In the depression between the covered tailings and the berm, water had pooled in a number of isolated ponds. It appeared there was no surface outlet for the pooled water to flow directly to Thompson Creek during dry periods. The pooled water in the depression had low pH (5.2 to 3.05), and red solid precipitates were seen within the various ponds. Red stains were found in the gravel in Thompson Creek and along its bank at several locations on the side of the creek adjacent to the reclaimed tailings. Also, a red stain line was observed on a large boulder about 0.6 m above the stream surface. This large boulder protruded from the bank on the side adjacent to the reclaimed tailings. The pH of Thompson Creek decreased by 0.5 pH (from 6.2 to 5.7) as it flowed past the floodplain containing the reclaimed tailings.

The observations that you are describing in your comment are the constructed wetlands that were developed by the Forest Service to contain the discharge of iron hydroxide and prevent it from reaching Thompson Creek.

It is likely that the red-precipitate and low pH in the ponds indicate the reclaimed tailings continue to generate acid-rock drainage (ARD). The pond water does not seem to be directly flowing into the Thompson Creek during low-flow conditions. However, the significant in the pH of Thompson Creek water flowing past the reclaimed tailings and the red precipitates within the creek bank on the side of the creek adjacent to the reclaimed area indicate that ARD is reaching Thompson Creek via groundwater flow beneath the constructed berm. The full extent of water quality degradation from this ARD will not be known until further sampling is conducted. Under Idaho's annual hydrologic cycle, the most significant releases of contaminants would probably occur during spring snow melt. The red-stain line 0.6m above the present low-flow water elevation may indicate even greater releases during high-flow conditions. In arid regions, interstitial waters in tailings containing high levels of dissolved solids can migrate to the

ground surface by capillary action. Upon evaporation of the water at the ground surface, the dissolved solids begin to precipitate. Depending on the mineralogy of the rock dissolved during the formation of ARD, the salts can range from $CaSO_4$ (gypsum) to $ZnSO_4$. Dissolution of the $ZnSO_4$ solid during the first rain event in the fall has led to massive fish kills in the Clarks Fork River. Collection and chemical analysis of the solid salts present at the elevation of the road prior to the fall rainy season may provide some insight into the nature of the chemical release from the reclaimed tailings. NMFS recommends IDEQ investigate these possible ARD problems. Reclamation activities implemented thus far may not be sufficient to protect water quality from periodic metals contamination episodes and pH impacts in this stretch.

It appears to be anticipated by the Forest Service that there will be continued ARD, and that the wetlands are intended to isolate ARD from the stream. The stains that you describe within the stream may also be from the period prior to the wetland construction. Changes in pH documented in Thompson Creek by the Forest Service at 5 sample sites above and below the reclaimed mill site appear to be within the range of the state water quality criteria for pH of 6.5 to 9.0 (IDAPA 58.01.02-250.01.a. Surface Water Quality Criteria for Aquatic Life Use Designations). The Scheelite Jim Wetlands PHASE II report is available from the Yankee Fork Ranger District.

IDEQ does not feel Thompson Creek is sediment limited, indicated by the presence of sediment intolerant invertebrates. As with the Yankee Fork, using biotic indices as the main indicator of sediment impairment is unsound. Also, simply noting fish presence, absent some evaluation of habitat quality, doesn't adequately identify the effects of sediment loading. Since IDEQ presents little data for sediment levels in Thompson Creek it is difficult to know if this stream is or is not sediment impaired. IDEQ identifies Thompson Creek as a reach lacking thorough data. Until data are obtained that adequately characterize sediment and metals loading for this reach, and adequately describe beneficial use support, NMFS believes the 303(d) listing should be retained.

See response above regarding issues that NMFS may have with the Beneficial Use Reconnaissance Program.

Upper Salmon River:
IDEQ proposes to delist the Upper Salmon River, from Hell Roaring Creek to Redfish Lake Creek, for sediment impairment. IDEQ provides limited data that indicate significant levels of fines are present (42% and 51%). There appears to be more discussion on the source of this sediment that was inadvertently eliminated from the document (page 51 in the document provided to NMFS on Jan 28, 2002) that may explain these high sediment levels. However, absent that discussion, the only data provided are the two extremely high percent fine levels. IDEQ identifies natural processes as the dominant sediment source in this reach, but goes on to identify sediment contributions from agricultural and recreational impacts. These impacts are not quantified in the document, providing little support for the position that sediment loads are not unduly elevated and could not be corrected through the TMDL process. The subbasin

assessment identifies this reach as one for which little data is available. Since the only monitoring data presented indicate high sediment loads, and the BURP program is not able to adequately determine listed salmonid population health, NMFS believes the 303(d) listing for this reach should be retained until data are provided that satisfactorily indicate no impairment.

This section of the Salmon River has been determined to be in full support of coldwater biota and salmonid spawning beneficial uses based on Large River BURP assessment and available fish data. Index scores were high and this segment of river has been identified for potential use as a reference segment for this size river.

NMFS is eager to participate in finding solutions to watershed impairment. As TMDLs and implementation plans for this subbasin are developed, NMFS would be pleased to offer opportunities to take advantage of NOAA habitat restoration funds. NOAA/NMFS has an active marine, estuarine and anadromous fresh water habitat restoration program. The NOAA Community-Based Restoration Program began in 1996 to inspire local efforts to conduct meaningful, on-the-ground restoration of marine, estuarine and riparian habitat. Since that time, NOAA has funded 179 small-scale habitat restoration projects around the U.S. coastline and in freshwater anadromous fish habitats. Most of these projects contain an outreach or education component to develop natural resource stewardship.

The program links seed money and technical expertise to citizen-driven restoration projects, and emphasizes collaborative strategies built around improving NOAA trust resources and the quality of the communities they sustain. Community-based habitat restoration helps repair habitats required by marine and anadromous fishes, endangered species and marine mammals. These programs have proven advantageous to communities in Washington and Oregon, and could provide assistance to Idaho residents as well. They may help fill gaps left by EPA, state, and private efforts, and become part of a cohesive strategy to correct ailing watersheds. Vincent Kozakiewicz (208-685-6905), in NMFS' Boise field office, can provide details and assistance to those interested in NMFS granting programs. Funding for these projects is provided through an annual direct solicitation for project proposals. Applications for fiscal year 2002 must be postmarked by April 15, 2002.

Thank you for this opportunity to comment on the draft Upper Salmon River subbasin assessment and TMDL. NMFS hopes that these comments can be used to further IDEQ's mission and promote recovery of listed Snake River salmon and steelhead. If you have questions regarding these comments, please call Chris Looney at 208-378-5689. I can also be reached via email at chris.looney@noaa.gov, or by post at NMFS, 10215 W. Emerald St. Suite 180, Boise ID, 83704.

Comments by EPA (response in bold print)

Thank you for the opportunity to review the draft Upper Salmon River Subbasin Assessment and Total Maximum Daily Load (TMDL) that was released for public

comment on January 22, 2002. Following are the U.S. Environmental Protection Agency (EPA) comments on this draft Subbasin Assessment and TMDL.

This draft document presents a Subbasin Assessment for the Upper Salmon River Watershed, a TMDL for Challis Creek for sediment, a TMDL for Kinnikinic Creek for zinc, and the analysis used in developing the TMDLs and Subbasin Assessment. EPA would like to acknowledge the significant effort that went into developing this Subbasin Assessment and TMDL. The following comments provide some suggestions on changes which would help clarify the Subbasin Assessment and TMDL, as well as comments regarding 303(d) listing issues that were raised in the Subbasin Assessment.

Executive Summary
Please include an orienting map that details the location of Challis and Kinnikinic Creek and where they are in relation to the Salmon River.

A map will be included in the Executive Summary that includes the Salmon River and Challis Creek, the TMDL stream.

Please include a brief discussion of the Idaho Water Quality Standards (WQS) that lead to the 303(d) listing of these waters as impaired for sediment and zinc and that the TMDLs are being developed to ensure compliance with these WQS.

As stated in the Executive Summary of the document TMDLs are written to restore full support of beneficial uses which include salmonid spawning and coldwater aquatic life. The origin of the 1998 §303(d) listing, from which the TMDL for Challis Creek is being prepared, is not related to particular water quality standards, but to beneficial use support. It is further stated that full support in Challis Creek may not be attained due to flow alteration, even after sediment BMPs are implemented. The Idaho Water Quality Standards for sediment are narrative and the intent of the TMDL is directed toward restoration of beneficial use support.

Kinnikinic Creek is listed for unknown pollutants on the 1998 §303(d) list. Water quality standards for zinc <u>are</u> quantitative, though the TMDL endpoint is restoration of beneficial use support. Sampling in April 2002 shows that zinc levels in Kinnikinic Creek are below criteria, streambank erosion is slight and that diversion of surface water to operate a hydroelectric turbine has been eliminated. It has become apparent that the greatest purturbance to water quality in Kinnikinic Creek was from dewatering of the stream channel below the mine. Fine sediment deposition has been observed to be primarily along the banks of the Creek and not in significant quantities. Spawning habitat is primarily above the Clayton Silver Mine on Kinnikinic Creek. Based on this follow-up assessment, in light of the fact that the tailings pile has been capped and the channel has been reconstructed to isolate it from the tailings the TMDL has been removed from the document.

DEQ will continue to evaluate beneficial use support through the regular monitoring of surface waters.

The listing of a 350% reduction for zinc in the Kinnikinic Creek Loading Summary is perplexing. The more common calculation for percent reduction for this case would be (225-59/225) which equates to a 74% reduction. Please include an explanation for how a 350% reduction will meet the WQS.

This load reduction is no longer warranted and will be removed.

Characterization of the Watershed
For orienting purposes, it would be helpful if the several maps between pages 3-10 included the names of landmarks, especially cities.

Challis and Stanley will be added to the maps to aid orientation.

Several of the Sub-Watershed Descriptions include discussion about temperature data. For example, on page 25 in the Upper Harden-Big Casino sub-watershed discussion it is noted that a spot temperature measurement in the Salmon River was as high as 18°C; based on the presentation of this material, EPA would encourage IDEQ to review all the temperature data that has been collected for the Upper Salmon Watershed to ensure that the criteria are being met and list any waters where the criteria are not being met.

Water temperature data that was provided to DEQ after written request was made to federal land management agencies for development of the Subbasin Assessment appear in sub-watershed discussions. Water quality data is requested from all known sources at the beginning of the Subbasin Assessment process. No raw data was received, only graphical data summaries were provided. If graphical representations of temperature data can be interpreted to show temperature criteria exceedances they will be described in the appropriate sections. Spot temperatures do not show criteria exceedance in relation to the percent of observations over a particular time, and TMDLs for temperature will not be written for streams based on single instantaneous temperature measurements. These data will be treated as anecdotal data. Bull trout temperature criteria, according to the US Fish and Wildlife Service, is still in consultation, and will not be used to write TMDLs by the Idaho Falls Regional Office of DEQ until resolved.

Throughout the Sub-Watershed Descriptions information is presented on sub-watersheds that do not include 303(d) listed water. In some cases the information presented suggests data gaps exist in determining if the waters are meeting Idaho WQS. For example, on pages 28-29 the Huckleberry-Fisher sub-watershed discussion mentions that Fisher Creek appears to have fine sediments in excess of 30% and that Gold Creek and Williams Creek are believed to have elevated fine sediment and reduced streambank stability. To better present this data in a way the public can easily understand, EPA recommends that IDEQ create a table similar to Table 20 on page 59, for Data Gaps that exist for non 303(d) listed waters.

If waters are determined to be in full support of aquatic life beneficial uses it is not implied that there is a data gap in determining if the waters are meeting Idaho WQS, particularly narrative "free from" standards. The data used in Sub-Watershed Descriptions is existing data supplied by agencies to aid in assessment of the Subbasin's water bodies. These water bodies receive continued monitoring by land management agencies and by DEQ.

The data gaps section is intended to reflect the data needs to further evaluate streams that are 303(d) listed and fall into Need Verification or Not Full Support assessment categories. Logistical limits of Federal Land Management agencies will dictate monitoring data priorities. Idaho WQS are not based on sediment targets used in TMDLs, and, conversely, compliance with Idaho WQS cannot be determined based on % fine sediment or % streambank stability since the standards are narrative and not based on these quantitative targets. A clearer statement will be made to illuminate the difference between TMDL sediment targets and water quality standards for the public's benefit as well as EPAs.

Page 27, Valley Creek
The information presented by the Forest Service habitat assessment data on sediment and stream bank stability suggest that Valley Creek is not meeting Idaho WQS and should be 303(d) listed for sediment and habitat alteration.

The Forest Service habitat assessment data show elevated depth fines and streambank stability less than 80%. Targets used in TMDLs are not to be confused with water quality standards, or Forest Service Standards for depth fines (20% in anadromous waters). Valley Creek is assessed to be in full support of aquatic life beneficial uses and will not be 303(d) listed for sediment or habitat alteration. Narrative water quality standards are being met in Valley Creek.

Water Quality Concerns and Status

Water Quality-limited Waters

Page 37, Water Quality-limited Waters
It should be noted that Squaw Creek has been 303(d) listed for temperature as stated in Table 3. It is no longer being proposed as suggested in the opening paragraph.

The text will be changed to reflect that EPA listed Squaw Creek based on an instantaneous temperature measurement collected as part of a BURP survey.

Page 38, Figure 7:
Kinnikinic Creek is not highlighted as 303(d) Listed.

The map will be changed to reflect Kinnikinic as a 303(d) listed water from Sawmill Creek to the Salmon River, approximately 3 miles.

Water Quality Standards

Page 39, Table 4:
Table 4 makes reference to Map Codes that relate to specific Water Bodies and Designated Uses, but no map is included to show what those Map Codes relate to. For clarity, a map should be included so the public can understand what those Map Codes are referring to.
The Map Code referred to in Table 4 has changed in the Water Quality Standards and should be referred to as a Unit Code. There is no map within the Water Quality Standards that refer to the unit codes, this designation is narrative for administrative use.

This column is represented in the text and will be removed to simplify the table.

For clarity, please note that existing uses must also be protected, in addition to Cold Water aquatic life and Primary and Secondary Contact Recreation.

A statement that defines existing and designated beneficial uses and their protection will be added to the Water Quality Standards section and to the Glossary

Page 40
For clarity, Idaho's standard for turbidity should be included with the discussion of the sediment standard.

The standard for turbidity will be added to this section.

For a better understanding of the relationship between nutrients and dissolved oxygen (DO), the DO standard should be included with the nutrient standard on page 40.

The standard for dissolved oxygen will be added to this section.

Page 41, Bull Trout Temperature Criteria
The Federal Bull Trout standard should be included in this section, as well as a discussion of which streams it applies to in this watershed.

The federal bull trout standard is included in this section.

Water Body Assessments

Page 42, Garden Creek
The BURP Assessment for Garden Creek within Challis city limits shows a "Need Verification" Assessment because of a 3.42 MBI Score and 65 Habitat Score, while the Subbasin Assessment recommends re-listing this section for flow and habitat alteration.

On page 62, in the Garden Creek Summary, it is stated that one sediment sample suggests high depth fines. Is DEQ planning to re-evaluate this site to ensure compliance with Idaho's WQS?

This reach is in compliance with Idaho's narrative WQS for sediment. The WQS for sediment are not based on depth fines. Garden Creek is included in the region wide Beneficial Use Recconnaissance Program for continued rapid bioassessment, which determines beneficial use support.

Page 43, Road Creek
The 1995 BURP Assessment shows that two sampling locations are not in full support of WQS for cold water biota. While one of the locations has low flow, the other had a flow of 14.5 cfs. The MBI Scores for the 1997 monitoring are both above the 3.5 threshold that are considered adequate by Idaho's water quality standards. It would be helpful to know where the sampling sites from 1995 are in relation to the sites from 1997, because it seems from the information presented that the area around an elevation of 1722 m is not fully supporting cold water biota. The Conclusions and Recommendations presented by Clark in Appendix F suggest that Road Creek is impacted by fine sediment. Based on this information, it would seem that Road Creek should be listed for sediment.

There is no question that Road Creek is impacted by fine sediment. Sediment impacts are not great enough to limit beneficial use support at sites that have adequate flow. Sites with adequate flow show full support. The 1995 site that you are referring to was sampled on June 27th during peak runoff. It is dry for significant periods after peak runoff in normal years. In dry years it may not flow at all during the period of snowmelt. The greatest purturbance to the stream here is lack of flow for significant periods of the year. The greater impact to the lower site at 1722 meters is from consistent and sustained dewatering for much of the year. If there comes a time when flow issues can be addressed and the reach continues to show less than full support then a sediment TMDL may be warranted. Until that time it can be expected that MBI scores will be quite variable due to flow conditions. This condition will be made more clear in the TMDL.

Page 45, Challis Creek
It is noted that there were no indications of deleterious levels of aquatic plants or nuisance levels of algae in Challis Creek. For clarity, IDEQ should include any DO, field survey or other data that has been collected to show how this conclusion was reached.

Dissolved oxygen data has not been collected through the BURP analysis or by land management agencies. Observations are made during erosion inventories.

Page 45, Thompson Creek
To better understand the possible influence of the Thompson Creek Mine, a discussion of where the BURP sampling locations are in relation to the mine and the Schellite Mill, should be included.

A map showing BURP locations and the Schellite Jim Mill Site will be developed and included in the text.

Please see the attached document, 303(d) Listing Comments, that have been provided by Region 10's Impaired Waters Coordinator, Kerianne Gardner.
303(d) Listing Comments (response in bold print)
For clarity, it would be helpful to know what BMPs were implemented and what data is available to show that they are working.

A complete description of the Scheelite Jim Wetlands and the associated water quality data was received from (and is available from) the Salmon-Challis National Forest: Yankee Fork Ranger District (HC67, BOX 650, Clayton Idaho 83227) on May 15, 2002. Scheelite Jim Wetlands Phase II: WETLANDS DEVELOPMENT, STREAM HABITAT RESTORATION AND WATER QUALITY MONITORING February 2002. This data has been summarized in the final TMDL.

Page 47, Warm Spring Creek
Statements in the third paragraph, pertaining to the need to develop a TMDL for "ditches", are not entirely accurate. If a waterbody does not meet the definition of a water of the U.S. (See 40 CFR 122.2), then the Clean Water Act and water quality standards do not apply to the water, and therefore TMDLs are not required. However, if Warm Springs Creek meets the definition of a water of the U.S., then a TMDL would be required since it is included on the Idaho 303(d) list, unless it can be demonstrated that it complies with water quality standards.

If there is a factual basis to conclude that Warm Springs Creek is not a water of the U.S., we recommend that you provide documentation in the SBA, and subsequently propose de-listing the waterbody.

If Warm Springs Creek is a water of the U.S., then options you might want consider include proceeding to write a TMDL, or in recognition that a coldwater aquatic life beneficial use and criteria may not be appropriate, defer TMDL development (e.g. TMDL schedule change) until such time as beneficial uses and criteria are revised

By definition, Warm Springs Creek is not navigable water of the United States, as it is used to define authorities of the Corps of Engineers, or the Environmental Protection Agency. As stated in the Federal Register in Vol. 51, No. 219 Part 329 § 329.3. Precise definitions of "navigable waters of the United States" … are ultimately dependent on judicial interpretation and cannot be made conclusively by administrative agencies.

Warm Springs Creek is diverted in its entirety into a manmade ditch for the primary use of agricultural irrigation, and secondarily for hydroelectric production. It's flow is not returned to surface water of the United States, and the ditch is not a water transfer system between waters of the United States. Warm Springs Creek: has not been, and is not susceptible to use in interstate commerce, is not interstate

water, nor would it affect interstate commerce, is not a recreational water subject to use by interstate travelers (it's exclusively on private land), and is not a commercial fishery.

The natural channel is dry, and is not expected to receive water in the future. Excluded in 40 CFR 122.2 under definitions of Waters of the United States are manmade bodies of water, which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. [See Note 1 of this section.] Waters of the United States do not include prior converted cropland.

Page 47, Yankee Fork
On page 59, Table 20 Yankee Fork is listed on the "Data Gaps for 303(d) listed water bodies," as having some sediment data and on page 25 in the Upper Harden-Big Casino Sub-Watershed Description it is stated that "The Yankee Fork is also presumed to be a major source of sediment to the Salmon River (SNRA, 1999c)." The BURP data presented on page 48 show that the sites sampled had high MBI scores, however two of the habitat scores fall below 70. In the discussion of the Yankee Fork it is also mentioned that two of the five sites sampled showed "significant increases" in depth fines. Based on all of this information, will IDEQ continue to monitor Yankee Fork for sediment problems?

As stated in the TMDL, habitat is not a recognized pollutant and the depth fines samples that increased were well below sediment targets identified in the TMDL.

This reach is in compliance with Idaho's narrative WQS for sediment. The WQS for sediment are not based on depth fines. The Yankee Fork of the Salmon River is included in the region wide Beneficial Use Reconnaissance Program for continued rapid bioassessment, which determines beneficial use support.

Page 49, Kinnikinic Creek
With respect to the language of the TMDL, the goals of the TMDL are erroneously described as "EPA Gold Book Standards". The goals should be described as the Idaho water quality criteria for zinc. Idaho has adopted federal toxics criteria into their water quality standards.

The reference will be changed to reflect 40 CFR 131.36 (b)(1) (National Toxics Rule) as incorporated by reference.

The Conclusions and Recommendations presented by Clark in Appendix F suggest that Kinnikinic Creek is impacted by fine sediment. Based on this information, it would seem that Kinnikinic Creek should be listed for sediment.

Kinnikinic Creek will continue to be evaluated to determine if it is potentially impacted by sediment in addition to zinc. Best management practices have been implemented to reduce sediment and metals loading to Kinnikinic Creek.

Continued monitoring will determine if beneficial uses continue to not be fully supported. Kinnikinic Creek is included in the region wide Beneficial Use Recconnaissance Program for continued rapid bioassessment, which determines beneficial use support. Kinnikinic Creek will be placed under category 4b of the 2002 Integrated Water Quality Monitoring and Assessment Report Guidance.

Page 50, Lost Creek

The Conclusions and Recommendations presented by Clark in Appendix F suggest that Lost Creek is impacted by fine sediment. Based on this information, it would seem that Lost Creek should be listed for sediment. While it is true that for flow that is below 1 cfs, numeric criteria do not apply. Narrative criteria still apply, as would be the case for sediment.

As stated in IDAPA 58.01.02 §.070 06: Numeric water quality standards only apply to intermittent waters during optimum flow periods sufficient to support the uses for which the water body is designated. For recreation, optimum flow is equal to or greater than five (5) cubic feet per second (cfs). For aquatic life uses, optimum flow is equal to or greater than one (1) cfs.

The narrative criterion for sediment is: Sediment shall not exceed quantities specified in section 250 (turbidity criteria), or, in the absence of specific sediment criteria, quantities which impair designated beneficial uses. Determination of impairment shall be based on water quality monitoring and surveillance and the information utilized in section 350.02.b.

Evaluations of surrogate measures are often used as a mechanism to reflect potential sediment problems. In the case of Lost Creek, streambank stability approaches 100% in a very low flow (.6 cfs) spring driven wet meadow system characterized by an E5 channel. Substrate fine sediment less than 6.35mm diameter greater than 80% are typical in this channel type.

Based on water quality monitoring and surveillance water quality criteria are being met. There is not impairment as a result of a nonpoint source activity by itself or in combination with other point and nonpoint source activities and there are no activities occurring in a manner not in accordance with approved best management practices. In summary, narrative sediment criteria are being met.

Page 50, Salmon River

The BURP data for the Salmon River shows that one of the 1995 locations, between Alturas Lake Creek and Hwy 93, is in full support of beneficial uses, yet the MBI score falls below the 3.5 and the Habitat Score falls below 70, scores that would typically lead to a "Needs Verification" assessment. The MBI score for the Headwaters above Frenchman Creek in the 1998 assessment is 2.48. IDEQ did note that the 1998 information has not been assessed. However, this information coupled with the 42% and 51% of depth fines less than 6.35 mm at the upper and lower sites would seem to indicate that these sites need further assessment to determine if all areas in question are full

support of beneficial uses. Table 20 on page 59, "Data gaps for 303(d) listed water bodies," also states that limited suspended sediment and temperature data are available for the Salmon River and there are only two depth fine samples, again this would seem to suggest that further assessment is needed before a determination about whether or not a TMDL would be necessary for this system.

The WQS for sediment are not based on depth fines. The Salmon River above Hell Roaring Creek is included in the region wide Beneficial Use Reconnaissance Program for continued rapid bioassessment, which determines beneficial use support. If the upper reach of the Upper Salmon River is assessed at less than full support on the next 303 (d) list it will have a total maximum daily load allocation developed in the next TMDL cycle.

Large River BURP assessment shows that the 303 (d) listed reach of the Upper Salmon River is in Full Support of Aquatic Life Beneficial Uses.

Page 53, Abandoned Mines and Mill Sites and NPDES Discharges
Based on the information presented in Tables 16 and 17, EPA agrees with IDEQ's recommendation that more sampling is needed to determine if there are any violations to the states WQS. The "Comments" suggest that for Clayton Silver Mine/Mill, Silver King Mine/Mill, and Livingston Mill more data needs be collected to determine if they are in compliance with Idaho WQS.

The information presented on the Thompson Creek tungsten mine site near Basin Creek, shows the pH to be below Idaho WQS. Based on this information, this section of the creek should be 303(d) listed for pH and a TMDL developed to address pH.

Data submitted after the public comment period shows that pH is within Idaho WQS for pH on Thompson Creek near Basin Creek. This data will be summarized in the Thompson Creek Water Body Assessment section.

Page 55, Table 18 Salmon-Challis National Forest Sampling Sediment Data
Based on the information on percent fines presented in this chart, the following have high sediment values: Morgan Creek (3A), East Pass Creek, Herd Creek, Tenmile Creek, McKay Creek, and Basin Creek. Will IDEQ be doing any follow up monitoring to ensure that WQS are being met?

The WQS for sediment are not based on depth fines. These streams are included in the region wide Beneficial Use Recconnaissance Program for continued rapid bioassessment, which determines beneficial use support. These streams currently are assessed to be full support of beneficial uses for aquatic life.

Page 59, Table 20
For 303(d) listed waters that have nutrient data gaps, EPA recommends that IDEQ list DO as a data gap, based on the relationship between nutrients and DO.

The Idaho WQS are narrative criterion for nutrients and are based on visible nuisance aquatic growth. Where there are visible levels of nuisance aquatic growth combined with elevated nutrients determined through laboratory evaluation it may be appropriate to evaluate dissolved oxygen. The Water Quality Standards section of the TMDL adequately discusses considerations related to DO sampling.

Challis Creek TMDL

A map should be included for Challis Creek that shows where it flows into the Salmon River and where landmarks are located (For example, in the Challis Creek TMDL mention is made of Mosquito Flat Reservoir and Challis Creek Road, but no map is include to show where these features are located). For clarity, the Challis Creek Summaries (pages 17-19 and pages 44-45) and the applicable Water Quality Standards should be included as part of the Challis Creek TMDL. In the discussion about Loading Capacities and Targets, information about the current sediment load in Challis Creek should also be included.

Given that the load allocations listed in Table 21 are addressed by reach number, a map needs to be included to show where the reaches are located on the creek. Please include on Table 21 that wasteload allocations are zero.

Figure 7. shows an overview of the relationship of Challis Creek to the Salmon River in the subbasin. A map that shows inventory reaches and landmarks will be incorporated into the TMDL section.

Including the TMDL with the Subbasin Assessment is intended to get away from the redundancy of including several sections in multiple places in the document. This system has been used successfully in previous approved TMDLs. It is not felt that repeating sections improves clarity.

<u>Loading Capacities and Targets</u> and <u>Load Allocation</u> are distinct sections in the EPA Region 10 TMDL Review Guidelines that list specific considerations. IDEQ has incorporated these considerations into the required elements. Immediately following the Loading Capacities and Targets section, for clarity, are sections on Existing Sediment Sources, Estimates of Existing Load, Waste Load Allocation and Load Allocation.

Kinnikinic Creek TMDL

A map should be included for Kinnikinic Creek that shows where it flows into the Salmon River and where landmarks are located.

Figure 7. shows an overview of the relationship of Kinnikinic Creek to the Salmon River in the subbasin.

Loading Capacity and Load Allocation

The TMDL elements are expressed as instream concentrations. These instream targets are important and should be provided in the document, but a more traditional TMDL

approach is to calculate loading capacity as the allowable metals load and allocate that load to natural background, point and non-point sources, and a margin of safety. For reference, this is the approach used in the Coeur d'Alene Basin TMDL. While the available flow data are more limited for this creek, one could estimate the range of potential flows and employ the same approach here.

Allocations for adits and/or mine tailings should be expressed as wasteload allocations, since they are considered point sources.

The TMDL elements are expressed as instream concentrations based on existing data. More precise data on natural background, point and non-point sources is not currently available. The particular loading for adits and specific tailings are arrived at as instream concentrations because specific loading data does not exist, and the relationship of groundwater inputs cannot be specified at this time. This, combined with the lack of an NPDES permit, precludes dealing with these potential sources as a wasteload allocation. Kinnikinic Creek will be placed under category 4b of the 2002 Integrated Water Quality Monitoring and Assessment Report Guidance.

Percent Reduction
The listing of a 350% reduction is perplexing. The more common calculation for percent reduction for this case would be (225-59/225) which equates to a 74% reduction.

The Kinnikinic Creek TMDL will be removed from the document because follow-up monitoring by DEQ has shown that the TMDL is no longer warranted and best management practices have been implemented.

Margin of Safety
The instream zinc goals of the TMDL (65 ug/l chronic and 59 ug/l acute) are calculated using the mean hardness (50 mg/l), and it is then asserted that the use of this hardness value represents a margin of safety. There is no margin of safety in using a mean hardness. Instead, the target concentration will be too high 50% of the time. The state of Idaho used the 5th percentile hardness value in establishing the instream zinc goals for the Coeur d'Alene River Basin TMDL for Dissolved Cadmium, Lead, and Zinc issued in August 2001. EPA's NPDES program also uses the 5th percentile hardness when establishing water quality-based permit limits.

EPA appreciates the opportunity to comment on the draft Upper Salmon River Subbasin Assessment and TMDL and looks forward to the final submission. If you have any questions regarding the comments on the draft TMDL, please contact me at 206-553-6326.

Sincerely,

Tracy Chellis
TMDL Project Manager

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GLOSSARY

7Q2 – A term used in the state Water Quality Standard to express the lowest 7-day average flow with an average frequency of recurrence of every two years.

"A" channel - A Rosgen channel type characterized by a fairly straight (sinuosity < 1.2), steep (high gradient 2-10%), highly confined (<1.4), single channel, with a low (<12) width to depth ratio.

Adaptive Management – An explicit and analytical process for adjusting management and research decisions to better achieve management objectives; this process should quantitative wherever feasible. Adaptive management recognizes that knowledge about natural resource systems is uncertain. Therefore, some management actions are best conducted as experiments in a continuing attempt to reduce the risk arising from that uncertainty. The aim of such experimentation is to find a way to achieve the objectives as quickly as possible while avoiding inadvertent mistakes that could lead to unsatisfactory results. The concept of adaptive management is readily understood because it represents the common sense of "learning by doing."

Agriculture Water Supply - A beneficial use, designated by the Division of Water Quality, which indicates that water quality is at such a level that it can be used for irrigation or livestock watering.

Aesthetics and Human Health - A beneficial use, designated by the Division of Water Quality, which indicates that water quality is good enough to not pose a significant health risk or be aesthetically unpleasant.

Allotment - An area of land designated and managed for the grazing of livestock.

Allotment Management Plan - A plan designed by the permitting agency and the user which prescribes the grazing management for the allotment, including rotation system and resource objectives.

Anadromous - An aquatic life history strategy where freshwater habitat is used for spawning and juvenile rearing and the ocean (saltwater) is used for maturation to adult.

Aspect - The direction a surface is facing, generally related to a magnetic bearing. A south aspect would face south.

Attainable Beneficial Use or Attainable Use – A beneficial use, that with appropriate point and nonpoint source controls, a water body could support in the future.

Background – The biological, chemical, or physical conditions of waters measured at a point immediately upstream (up gradient) of the influence of an individual point or nonpoint source discharge, or existing prior to the point or nonpoint discharge if no valid up gradient site is available.
Base Flow - The water flow as measured during the period of lowest standard flow; in this area, it is usually mid-summer.

"B" channel - A Rosgen channel type characterized by a moderately straight (sinuosity 1.2-1.4), steep (high gradient < 2-9%), moderately confined (1.4-2.2), single channel, with moderate (14-26) width to depth ratio.

Beneficial Use - A term used by the Idaho Department of Environmental Quality to identify uses which water quality supports in a given stream or lake.

Best Management Practice (BMP) - A state of Idaho standard that defines a component practice or combination of component practices determined to be the most effective, practical means of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals.

Biological Evaluation/Assessment - A process document that evaluates the effect of a regulated action on the biologic species under investigation and quantifies the extent of that effect. If it is determined that an action "may affect" the given species, consultation with the designated oversight agency (either National Marine Fisheries Service or US Fish and Wildlife Service) is required.

BLM - Bureau of Land Management, United States Department of the Interior.

C - Celsius; a temperature scale where freezing occurs at 0 degrees and boiling at 100 degrees.

Candidate Species - A species under investigation for listing under the Endangered Species Act, but for which limited information is known about its current status or biological vulnerability, or for which regulatory rules have been created but not issued.

"C" channel - A Rosgen channel type characterized by a winding (sinuosity > 1.4), flat (low gradient < 1-3.9%), unconfined (> 2.2), single channel, with a moderate to high (> 12) width to depth ratio.

***Carex/Juncus* Community** - A vegetative community composed predominately of sedges and rushes.

cfs - cubic feet per second; used for characterizing the volume of moving water in a stream.

Channelization - The action of altering the natural stream channel and hydrology of the system to redirect water flow or prevent soil loss.

Channel Type - A classification system which seeks to identify the hydrologic characteristics of a stream, such as sinuosity, gradient, meander potential and bank characteristics.

Cobble Embeddedness - The degree to which cobbles are surrounded or covered by fine sediment (sand or silt); usually expressed as a percentage.

Cold Water Biota - A beneficial use, designated by the Idaho Division of Water Quality, which indicates that water quality is high enough to support macroinvertebrates and fish.

Cumulative Effects - All of the combined actions and resultant effects which must be considered to effectively evaluate the effect of an additional, new action (i.e., a review to see if this is "the straw that will break the camel's back").

Deferred Rotation - A grazing system in which pastures are used at different times each year.

Degradation - The alteration of a given biological community in a negative manner which reduces the viability or diversity of the community and results in a change in ecological processes.

DEQ – State of Idaho Department of Environmental Quality.

Discretionary Action - An action that a land management agency has the ability to regulate.

Dispersed Recreation - Any recreational activity that doesn't occur at a designated recreational site or area.

Diversion - A physical structure that redirects water flow from a stream or spring into a ditch used for irrigation purposes.

Diversity - A variety of plants, animals or community types.

Ecological Condition - A reflection of the dynamic equilibrium of an overall watershed; the long term health of the complete system and not individual parts of it.

Ephemeral - A water source that only flows at certain, irregular times of the year, such as at spring runoff or during thunderstorms.

F - Fahrenheit; a temperature scale where freezing occurs at 32 degrees and boiling at 212 degrees.

Fault - A fracture or a zone of fractures along which there has been displacement of the sides relative to one another parallel to the fracture.

Fecal Coliform Bacteria – A type of bacteria common to the digestive tract of warm blooded animals that is identified as an indicator of the presence of a range of pathogenic bacteria that can cause illness to humans or livestock if ingested.

Fines – A particle of sediment below a designated diameter (such as 6.35 mm) that is known to effect salmonid egg or fry survival through emergence.

Fish Screen - A screen on a diversion designed to allow water to flow through it while preventing passage by fish and directing them back into the stream.

Flood Irrigation - A method of irrigation using water diverted from a stream or spring through a ditch that allows the water to flow across a wide area, using gravity or topography to spread the water.

Forb - Any herbaceous plant, other than a grass, especially one growing in a field or meadow.

Forest Land - Forested lands of ten or more acres capable of being ten percent stocked by forest tree species, and not currently set aside for non-timber use.

FS – United States Forest Service, Department of Agriculture

Full Support – A category of water quality status. A water body whose status is "Full Support" is in compliance with those levels of water quality criteria listed in Idaho's *Water Quality Standards and Wastewater Treatment Requirements*, or with reference conditions approved by the Idaho Department of Environmental Quality Director in consultation with the appropriate Basin Advisory Group.

Functional at Risk Condition - Riparian-wetland areas that are in a functional condition but an existing soil, water or vegetation attribute makes them susceptible to degradation.

Geometric Mean – The nth root of the product of n data: $((X_1)(X_2)(X_3))^{1/3}$ Used to establish the central tendency when averages of rates or index numbers are required.

Gradient - A measure of steepness of ascent or descent. In this document it is usually used in reference to streams and the topographical rate of descent.

Habitat Inventory - A stream habitat inventory evaluates and attempts to characterize the stream channel. A riparian habitat inventory evaluates the vegetative characteristics of the riparian corridor.

Herbaceous (vegetation) - A vegetative group including grasses and forbs, but excluding woody vegetation such as willows or sagebrush.

Habitat Index (HI) - A tool used to evaluate whether beneficial uses of aquatic life are being supported; aquatic habitat criteria are scored and compared against a standard based on the ecoregion being evaluated.

Hydrologic Divide - Topographical feature that bounds a watershed or watershed by forcing all water to flow one direction (e.g., Continental Divide).
Hydrology - The scientific study of the properties, distribution and effects of water on and below the earth surface; the effect of flowing water on the land or stream channel.

Instantaneous – A characteristic of a substance measured at any moment (instant) in time.

Interdisciplinary Team - A team comprised of people with various educational or professional backgrounds and individual abilities.

Intermittent - A water source which only flows on the surface at irregular intervals along the stream channel. It flows subsurface along the remainder of the stream channel.
Issue - A matter of wide concern.

Land Disposal - A process of transferring land from public ownership to private ownership.

Land Exchange - A transfer of land of nearly equal value between public and public ownership.

Lateral Recession Rate - The rate at which a stream bank erodes away from its original position in relation to the stream.

Loading: Acute – The relatively short duration of the presence or addition of a pollutant, such as sediment or bacteria, to surface water above specified water quality criteria.

Loading: Chronic – The longer term duration of the presence of a pollutant, such as sediment or bacteria, to surface water above specified water quality criteria.

Macroinvertebrate Biotic Index (MBI) - A tool used to evaluate water quality based on quantitative measurements of biological attributes of the communities of aquatic insects present at a sample site. Scores are adjusted based on the ecoregion being evaluated.

Margin of Safety – The additional load reduction applied to a load allocation to increase the likelihood that beneficial uses will be restored in a reasonable period of time.

Monotype - A community that contains only one species of vegetation, lacking the normal diversity found in similar locations.

Moraine - A pile of debris, including rocks and dirt, which is pushed ahead of, or along the sides of a glacier.

Natural Condition – A condition without human-based disruptions.

Needs Verification- A category of water quality status. A water body whose status is "Needs Verification" has not been assessed due to a need for additional information that will allow the distinction between "Full Support" and "Not Full Support."
Non-Functioning Condition - Riparian-wetland areas that are clearly not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, etc. The absence of certain physical attributes such as a floodplain where one should be is an indicator of nonfunctioning conditions.

Non-point Source Pollution – A pollution source that is ill-defined or comes from a broad area, such as sedimentation.

Not Full Support – A category of water quality status. A water body whose status is "Not Full Support" is not in compliance with those levels of water quality criteria listed in Idaho's *Water Quality Standards and Wastewater Treatment Requirements*, or with reference conditions approved by the Idaho Department of Environmental Quality Director in consultation with the appropriate Basin Advisory Group.

Noxious Weed - A weed arbitrarily defined by law as being especially undesirable, troublesome and difficult to control.

OHV - Off-highway vehicle; any vehicle capable of traveling off the highway.

Outmigration - The action of fish leaving their birthplace, rearing or spawning area and moving a significant distance out of a given system into another for the needs of a different life stage.

PACFISH - A BLM and FS directed, comprehensive and coordinated strategy for restoring and protecting the habitat of anadromous fish affected by dam construction and operation, water diversions, hatchery operations, fish harvest and the widespread degradation of the habitats of these species.

Parcel - Any piece of land.

Patented Land - Land that has been transferred to private ownership, and that is still retained by the original owner.

Perennial - A water source that flows throughout the year, each and every year.

Physiographic Province - A region of which all parts are similar in geologic structure and climate, and which has consequently had a unified geomorphic history.

Pollution – Any alteration in the character or quality of the environment that renders it unfit or less suited for beneficial uses.

Primary Contact Recreation - A beneficial use, designated by the Division of Water Quality, that indicates that water quality is good enough for any activity in which full or partial, unprotected bodily contact occurs with water (e.g. swimming or wading).

Proper Functioning Condition - Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris are present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality. This vegetation also filters sediment; captures bedload; and aids floodplain development; improves flood-water retention and ground-water recharge; develops root masses that stabilize stream banks against cutting action; develops diverse ponding and channel characteristics to provide the habitat and the water depth, duration and temperature necessary for fish production, waterfowl breeding and other uses; and supports great biodiversity. The functioning condition of riparian wetland areas is a result of interaction among geology, soil, water and vegetation.

Range Condition - A classification system (Excellent, Good, Fair or Poor), which provides an indication of the ecological health of the area and the degree of management necessary to maintain or improve the current condition. These classifications are generally indicated by differences in species composition, or deviation from the perceived potential of the site. Differences between condition classes are somewhat arbitrary because they form a continuum across a spectrum with ill-defined borders.

Reconnaissance – An exploratory or preliminary survey of an area.

Redd - The spawning nest of a fish dug in the stream bottom, which covers the eggs until emergence.

Reference Condition – A condition that fully supports applicable beneficial uses, with little effect from human activity and represents the highest level of support attainable.

Regression Analysis – Regression Analysis is the analysis of the relationship of two variables that may allow prediction of one variable from another variable. The dependent variable is assumed to be determined by (is a function of) the magnitude of the second (independent) variable.

Resident Fish – Non-anadromous fish that are generally native or naturalized exotic species. Resident fish may migrate within or between subbasins or watersheds at various life history stages to utilize various habitat aspects within their preferred range.

Resource Objective - An objective to be reached or maintained, which defines the desired condition of the resources.

Riparian - A vegetative community associated with surface or subsurface waters and watercourses within active watersheds. This community is rich in diversity of plants, as well as wildlife and aquatic organisms. The habitat includes not only lake and river ecosystems, but also wetland communities.

Riparian Habitat Conservation Agreement (RHCA) - A PACFISH term designating portions of watersheds where riparian-dependant resources receive primary emphasis, and management activities are subject to specific standards and guidelines. These areas include traditional riparian corridors, wetlands, intermittent headwater streams, and other areas where proper ecological processes are crucial to the maintenance of the stream's water, sediment, woody debris, and nutrient delivery systems.

Riparian Management Objective (RMO) - Objectives that are designed to measure the functionality of the riparian area and its affected stream channel. PACFISH has a set of RMO's that must be met for streams with anadromous fish unless local biologists have data that can define ones better suited to local conditions.

Salable Timber - Timber in an area designated for commercial timber harvest, accessible for harvest, and which contains trees favorable for sale.

Salmonid Spawning - A beneficial use, designated by the Idaho Division of Water Quality, which indicates that water quality is good enough for salmonid fish to use for spawning with a high chance of egg survival.

Screened Diversion - A diversion which has a fish screen on it.

Secondary Contact Recreation - A beneficial use, designated by the Idaho Division of Water Quality, which indicates that water quality supports any activity in which partial or incidental, protected bodily contact occurs with water (e.g., fishing).

Sediment-Sorbed – Molecules adhering to the surface of a solid sediment.

Shrub - Multi-stemmed woody vegetation not large enough to be considered a tree, such as a rose, willow, current, etc.

Sinuosity - The ratio of stream channel length to valley length.

Subbasin - A collection of watersheds that forms a much larger area, which yet drains into another, larger system.

Substrate - The stream bottom, composed of silt, sand, gravel, cobble, boulder or bedrock. The type of substrate and its looseness affects the ability of fish to spawn and the survivability of the eggs.

Suspended Sediment - Fine sediment suspended within the water column of moving or standing water.

Synoptic Sampling - Sampling at an upstream site, and timing sampling at a downstream site, such that the sample is collected at the time the same water sampled upstream is passing the sampling location downstream. The purpose is to take out any diurnal variance in water conditions.

Terminal Moraine - A pile of dirt and rocks pushed in front of a moving glacier that was left behind when the glacier receded.
Thermal Sanctuary - A refuge area that has water temperatures lower or higher than the surrounding waters, to the degree that it reduces the metabolic stress to the fish (e.g., a tributary spring or upwelling groundwater source).
Thrust Fault - A fault with a dip of 45 degrees or less over much of its extent, on which the hanging block appears to have moved upward relative to the footwall. Horizontal compression rather than vertical displacement is its characteristic feature.

Topography - The physical features of a place or region.

Transverse Fault - A fault that strikes obliquely or perpendicular to the general structural trend of the region.
Tributary - A river or stream that flows into a larger river or stream.

Unauthorized Use - An action or use of federal lands that has not been authorized by the regulatory agency or is outside the allowable season of use.

Unscreened Diversion - A diversion that does not have a fish screen on it.

Viability - Capability to grow or develop under normal conditions.

Warranted but Precluded - A phrase used to indicate that a species under consideration for listing as threatened or endangered probably should be listed but other species are in more immediate danger and time or monies don't allow for equal consideration at this time.

WEPP – Water Erosion Prediction Project: the WEPP model is a process-based, distributed parameter, continuous simulation, erosion prediction model for use on personal computers. The software is produced by the U.S. Department of Agriculture National Soil Erosion Research Laboratory at Purdue University and is available for free download at: http://topsoil.nserl.purdue.edu/weppmain/wepp.html.

Water Body – A homogeneous classification that can be assigned to rivers, lakes, estuaries, coastlines, streams or other water features.

Water Quality – A term used to describe the biological, chemical, and physical characteristics of water with respect to its suitability for a beneficial use.

Water Quality Target – An interim goal of water quality or habitat condition that provides the potential for beneficial use status of "Full Support." Percent subsurface or instream surface fine sediment, stream bank stability, percent overhead cover, riparian buffer width and average daily stream temperature are examples of possible targets.

Watershed - A side stream and all the land that it drains, which is a tributary to a much larger stream or river.

Wolman Pebble Count - A monitoring tool used to determine the amount of surface fines (material < 6.35 mm) as an index of sedimentation and beneficial use impairment. The samples are conducted at the same sites macroinvertebrates are collected. The sampler walks across the stream, from bankfull width to bankfull width, selecting pebbles at equidistant intervals. The intermediate axis is measured and recorded for each sample. A minimum of 50 samples from each cross-section must be obtained.

Woodland - Forested land used to provide forest resources such as firewood and Christmas trees, and is not used in the determination of the annual allowable cut.

APPENDICES